

EXHIBIT 24

Reply Report of Caroline M. Hoxby, Ph.D., dated June 8, 2018

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF
NORTH CAROLINA

STUDENTS FOR FAIR ADMISSIONS, INC.,		Case 1:14-cv-00954-LCB-JLW
Plaintiff,		
v.		
UNIVERSITY OF NORTH CAROLINA, et al.,		
Defendants.		

REPLY REPORT OF CAROLINE M. HOXBY, PH.D.

June 8, 2018

CONTAINS CONFIDENTIAL INFORMATION SUBJECT TO PROTECTIVE ORDER

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I. Introduction and Summary of Opinions

1. I have submitted two expert reports in this matter.¹ Fundamentally, these reports address two separate inquiries: (1) whether race is used as a dominant factor in undergraduate admissions at The University of North Carolina at Chapel Hill (“UNC”) (which Prof. Peter Arcidiacono’s opening and rebuttal reports consider) and (2) whether a workable race-blind alternative admissions plan exists that would allow UNC to maintain its pursuit of diversity while also maintaining its high academic standards (which Mr. Richard Kahlenberg considers in his opening and rebuttal reports).^{2,3}

A. Race is Not a Dominant Factor in UNC’s Admissions Decisions

2. With respect to the first inquiry—UNC’s use of race in its undergraduate admissions decisions—in my opening report, based on my empirical analysis of UNC’s actual admissions data, I concluded that:⁴

- i. UNC admissions decisions cannot be explained using a formula based on verifiable student characteristics.⁵ As a result, I concluded that UNC’s admissions process is not formulaic—a result that is consistent with a holistic admissions process.
- ii. An applicant’s race does not determine UNC admissions decisions formulaically, and is not a dominant factor in admissions.

3. I maintain these opinions even though Prof. Arcidiacono suggests the opposite result. Specifically, in my rebuttal report, I explained that Prof. Arcidiacono’s claims in his opening report relating to the role of race in the admissions process are unreliable and misleading because his models are overfit in the statistical sense,⁶ do not effectively model UNC’s holistic

¹ Expert Report of Caroline M. Hoxby, January 12, 2018 (“Hoxby Opening Report”); Expert Rebuttal Report of Caroline M. Hoxby, April 6, 2018 (“Hoxby Rebuttal Report”).

² Expert Report of Peter S. Arcidiacono, January 17, 2018 (“Arcidiacono Opening Report”); Expert Report of Richard D. Kahlenberg, January 12, 2018 (“Kahlenberg Opening Report”); Expert Rebuttal Report of Peter S. Arcidiacono, April 6, 2018 (“Arcidiacono Rebuttal Report”); Expert Rebuttal Report of Richard D. Kahlenberg, April 6, 2018 (“Kahlenberg Rebuttal Report”).

³ In this report, I use the terms “race” and “race/ethnicity” interchangeably to mean “race and ethnicity.”

⁴ Hoxby Opening Report, ¶ 6.

⁵ A verifiable student characteristic is one that is sufficiently objective that two different application readers would be expected to read it the same way. GPA is an example. Hoxby Opening Report, ¶ 38.

⁶ By “overfit,” I mean that his models perform much worse out-of-sample than in-sample. Hoxby Rebuttal Report, ¶ 8.

admissions process, and cannot be used to model admissions for the pool of potential applicants.⁷ In addition to the problems with his modeling approach that I documented, I noted also that he chose to focus his “transformation examples” on small sets of applicants who are not representative of UNC’s applicants or admitted students.⁸ Also, his analysis uses a fundamentally flawed method, one symptom of which is that it produces a predicted UNC class that far exceeds the number of slots that UNC actually has for its entering class.⁹ Thus, his analysis did not establish that race is a dominant factor in admissions decisions nor that race is used formulaically in those decisions.

4. Prof. Arcidiacono’s analysis and opinions in his rebuttal report repeat all of these same problems. Furthermore, in his rebuttal report, he has introduced additional misleading and unreliable calculations. Prof. Arcidiacono claims to show that his model of UNC admissions has high “accuracy,” but the analysis he provides to support this claim is critically flawed and cannot be relied upon to answer the relevant questions of whether race is a dominant factor in admissions or whether UNC admissions can be explained using a formula.

5. Specifically, when Prof. Arcidiacono claims that his model of UNC admissions is “accurate,” what he means is that the model does a better job of predicting whether a student is admitted than a random model (like choosing names from a hat or lottery jar) would.¹⁰ This way of defining “accuracy” is not appropriate, nor informative, for the questions at hand. By defining “accurate” as “not random,” Prof. Arcidiacono’s analysis does not answer the relevant inquiry of whether the admissions process is formulaic (and therefore inconsistent with a holistic consideration of an applicant). If a process is formulaic, it can be 100 percent explained by a model. If a process is at random, it can be 0 percent explained by a model. Prof. Arcidiacono is, thus, effectively claiming that any model that explains more than 0 percent is “formulaic.” This is incorrect: there are many percentages between 0 percent (random) and 100 percent (formulaic).

6. UNC does not claim that its admissions decisions are random or close to random. Indeed, in my opening report, I briefly reviewed UNC’s admissions process, in which numerous academic, extracurricular, and personal factors are taken into careful consideration when

⁷ Hoxby Rebuttal Report, ¶ 8.

⁸ Hoxby Rebuttal Report, ¶ 7.

⁹ Hoxby Rebuttal Report, ¶¶ 71–72.

¹⁰ Arcidiacono Rebuttal Report, pp. 13, 24, 28.

deciding whether to admit a student.¹¹ My empirical analysis bears out this description of the admissions process: although there are several factors that are correlated with and may influence admissions decisions, there is no formula that replicates admissions decisions. Rather the empirical results are consistent with a holistic process.¹²

7. Prof. Arcidiacono also claims that the “marginal effect of race” is large in admissions decisions.¹³ That is, he claims that race plays an outsized role in whether an applicant is admitted or not. However, the calculations that he presents to support this claim are nothing more than reframed versions of the “transformation examples” that he presented in his opening report. In these “transformation examples,” he claims to be “transforming” a white applicant into—say—an African American applicant and calculating a new probability of admission. As I explained in my rebuttal report, the “transformation examples” are highly misleading and unreliable for three main reasons. First, they focus on a small subset of students who are unrepresentative of UNC’s admits. Second, his method computes admissions probabilities that are incorrect. As a result, the application of his method produces a hypothetical UNC class that is far larger than the limited number of spots available at UNC. Third, Prof Arcidiacono’s model, which is the basis for his calculations, is unreliable for several reasons, including overfitting.¹⁴ All of these issues from his opening report remain in his rebuttal report.

8. Prof. Arcidiacono further claims the “share [of the admissions decision] due to racial preferences” is large.¹⁵ By this, he implies that race plays a more important role than other factors within an applicant’s profile. But, the calculations that he presents to support this claim do not support such a conclusion: what he calls “shares” are not “shares” because they add up to substantially more than 100%. By definition, shares of a whole cannot add up to more than 100%. Moreover, Prof. Arcidiacono’s “share” of the admission decision attributable to race only seems large because his report does not acknowledge that the total “shares” add to far more than 100%. For instance, a “share” of 30 might seem substantial compared to a “whole” of 100, but might seem small compared to a “whole” of 400 or 500. Fundamental flaws in Prof. Arcidiacono’s method are the reason its “shares” add up to far more than 100. Thus, Prof.

¹¹ Hoxby Opening Report, Section II.C.

¹² Hoxby Opening Report, ¶¶ 47–52, 57–58.

¹³ Arcidiacono Rebuttal Report, pp. 29–32.

¹⁴ Hoxby Rebuttal Report, ¶ 71–72.

¹⁵ Arcidiacono Rebuttal Report, pp. 16, 30, 32.

Arcidiacono presents calculations that are not meaningful statistically and do not support his conclusions.

9. Finally, as in his opening report, Prof. Arcidiacono continues to make claims about “unobservable” factors in a UNC admission decision that are not supported by any evidence and are driven only by Prof. Arcidiacono’s assumptions.¹⁶ What Prof. Arcidiacono refers to as “unobserved factors” are any factors or determinants of admissions decisions that are not included in his models. In his rebuttal report, he presents a supposed comparison of the “size of unobservables” to the “size of racial preferences.” But, as I show below, this comparison is conceptually flawed because (i) even if were correctly done, it would not speak to the question at hand (whether race and ethnicity play a dominant, formulaic role in admissions); (ii) the “size of unobservables” is determined by how overfit his model is; and (iii) his calculations depend on his unsupported assumption that the “unobservables” are uncorrelated with the factors he included in his model. Prof. Arcidiacono’s results provide no evidence of racial preferences; they are driven entirely by his assumptions and modeling choices.

B. No Workable Race-Blind Alternative Exists for UNC

10. With respect to the second inquiry—whether a workable race-blind alternative exists—I concluded based upon my empirical analysis of both UNC admissions data and data relating to the hypothetical pool of applicants that would likely apply if UNC implemented a change in admissions policy that:

- i. If UNC were to use a race-blind admissions policy, it would necessarily reduce UNC’s ability to both meet its diversity goals and maintain the level of academic preparedness of its admitted students.¹⁷ As part of this analysis, I showed that socioeconomic status is not a good proxy for (i.e., is not highly correlated with) race/ethnicity, especially among high achieving North Carolina high school students.¹⁸ I also examined class rank percentage plans and geographic-based plans.¹⁹

¹⁶ Arcidiacono Opening Report, pp. 57–61; Arcidiacono Rebuttal Report pp. 32–34.

¹⁷ Hoxby Opening Report, ¶¶ 216, 237, 257.

¹⁸ Hoxby Opening Report, Section V.A.

¹⁹ Hoxby Opening Report, Sections VI–VII.

- ii. The reduction in academic achievement under each hypothetical race-blind plan is large enough to materially reduce UNC's fulfilment of its mission to provide world-class educational and research opportunities to North Carolinians.²⁰

11. Mr. Kahlenberg, in contrast, concluded in his opening report that there are “race-neutral alternatives available that could provide UNC with the educational benefits of diversity without the use of racial preferences.”²¹ In my rebuttal report, I demonstrated that Mr. Kahlenberg's assertions about the feasibility of race-blind alternative plans were unfounded.²² In addition, his analysis (which was implemented by Prof. Arcidiacono) was based on unsupportable assumptions and the flaws in Prof. Arcidiacono's models. In particular, the simulations conducted by Prof. Arcidiacono but included in the Kahlenberg Report (the “KA Simulations”) did not allow for the possibility that a change in how UNC admits students would change the set of students who apply.²³ Not allowing for this possibility is particularly problematic given the enormous size of the socioeconomic preferences proposed by Mr. Kahlenberg.

12. In his rebuttal report, Mr. Kahlenberg supplemented his analysis of race-blind alternatives by conducting additional simulations based on the plans in my opening report and in his opening report. In particular, he constructed alternative simulations of race-blind plans based on socioeconomic status and class rank percentile. I conclude again that Mr. Kahlenberg has not provided evidence of a workable race-blind alternative that would allow UNC to maintain its racial diversity while also maintaining its current academic standards.

13. First, Mr. Kahlenberg presented a plan related to the SES-based plans analyzed in my opening report but—crucially—he assumed that UNC could “complete the class” (i.e., enroll students who are not socioeconomically disadvantaged) by enrolling all of the non-disadvantaged students who have the highest SAT scores and GPAs—*regardless of whether or not they were actually admitted by UNC*. That is, Mr. Kahlenberg proposed entirely replacing UNC's holistic review with a plan that looks only for students with high test scores and grades. Arbitrarily requiring UNC to abandon holistic review does not reflect a serious analysis of whether a workable race-blind alternative exists.

²⁰ Hoxby Opening Report, Section IX.

²¹ Kahlenberg Opening Report, p. 5.

²² Hoxby Rebuttal Report, Sections IV–V.

²³ Hoxby Rebuttal Report, Section IV.B.

14. Even if we hypothetically accept Mr. Kahlenberg's substitution of test score/grade-based admission for holistic review, Mr. Kahlenberg's comparisons are wrong because he does not set an appropriate baseline. To fairly make this comparison, he would need to compare his "SES plan" to what UNC's admitted class would look like in the absence of his plan but with admissions based purely on test scores and grades. That is, Mr. Kahlenberg misleadingly claimed to be showing the effect of an SES-based race-blind alternative when what he is really showing is mainly the effect of test score/grade-based admissions (combined with outsized weights for socioeconomic status).

15. Second, Mr. Kahlenberg presented both another SES-based plan ("Simulation 6") which is a variant of Simulation 4 in his opening report and a new "Percentage Plan" simulation. Both of these simulations inherit all of the errors of the original KA Simulations, which are discussed in my rebuttal report.²⁴

16. Third, Mr. Kahlenberg claimed to endorse the Census tract/geographic-based-plan presented in my opening report, but he appears to have misunderstood my findings of the likely outcomes of that plan. Contrary to Mr. Kahlenberg's claim, that analysis demonstrated that a geography-based race-blind alternative would not allow UNC to maintain both racial diversity and its academic preparedness standards.

17. Fourth, Mr. Kahlenberg speculated about the likely success of various additional race-blind strategies without making any attempt to model their potential impacts. In this report, I consider the potential effects of these proposals. Specifically, I find that increasing community college transfers and partnering with disadvantaged schools would lead to a substantial reduction in the academic preparedness of UNC's admitted class. Similarly, despite Mr. Kahlenberg's assertions, I find very limited potential impact of making admissions blind to the alumni status of a student's parents. Although Mr. Kahlenberg claims that UNC's Early Action program gives an advantage to affluent students, I note that this is not what research and logic suggest. Mr. Kahlenberg appears to have conflated UNC's Early Action program with an Early Decision program. These two types of programs have very different effects. In short, none of the above strategies—about which Mr. Kahlenberg speculates—would allow UNC to use race-blind admissions to simultaneously achieve its goals regarding academic preparedness and racial/ethnic diversity.

²⁴ Hoxby Rebuttal Report, Sections IV–V.

18. In addition, Mr. Kahlenberg's suggestions regarding increased levels of financial aid are based on no actual analysis, and they ignore the fact that UNC is *already* a national leader in providing affordable high quality education to students in its state.

19. Finally, Mr. Kahlenberg attempts to mischaracterize my research on the potential for recruiting-based policies to substitute for race-conscious admissions by misinterpreting an email that I sent. In this report, I provide context to that email and correct Mr. Kahlenberg's misunderstandings of my research.

II. UNC Admissions Cannot Be Explained by a Formula and Race is Not a Dominant Factor in Admissions

20. In my opening report, I concluded that UNC admissions decisions cannot be explained using a formula containing verifiable student characteristics and that decisions are consistent with holistic review of candidates.²⁵ I also found that an applicant's race does not determine admissions outcomes in a formulaic way.²⁶ I further found that the role of race in admissions decisions overall could in no way be characterized as dominant.²⁷ The essence of the approach taken in Prof. Arcidiacono's two reports is to focus only on a non-representative subset of students for whom race appears to play a role (at least, according to his model, which I do not endorse). He then provided interpretations based on these selected cases to make sweeping, general claims about the whole admissions process. This statistically unwarranted approach (or extrapolation) does not lead to reliable conclusions about the role of race within UNC's admissions process as a whole.

21. By contrast, in my opening and rebuttal reports, I analyzed the entire pool of applicants, admitted students, or matriculating students (sometimes focusing specifically on in-state students), which allowed me to reliably answer the question of whether race is a dominant factor in UNC admissions.

22. In this section, I describe several flaws in Prof. Arcidiacono's approach and calculations and I address each of the major claims put forward in Prof. Arcidiacono's rebuttal report. In Section II.A, I address his claimed calculation of the "marginal effect of race" and the "share [of

²⁵ Hoxby Opening Report, ¶ 6.

²⁶ Hoxby Opening Report, ¶¶ 47–52, 57–58.

²⁷ Hoxby Opening Report, ¶¶ 53–56.

admissions decisions] due to racial preferences,” which I show below are extremely misleading because they are not, in fact, “shares.”²⁸ In Section II.B, I address Prof. Arcidiacono’s claims that his models of UNC admissions have high “accuracy,” do “an excellent job fitting the data,”²⁹ and imply that “UNC’s in-state admissions are guided by an implicit formula.”³⁰ I disagree with his assessment, because his chosen measure of “accuracy” is not informative and the “accuracy” he claims to find is driven almost entirely by academic factors and not racial preferences. In Sections II.C and II.D, I address “errors” that Prof. Arcidiacono claims I made in modeling UNC admissions and in interpreting the results of my models.³¹ I disagree and stand by the analysis and opinions within my opening report. In Section II.E, I address Prof. Arcidiacono’s claim that racial preferences have “an outsize impact on admissions decisions” because they are “substantially more important than unobserved factors.”³² Prof. Arcidiacono’s analysis on this point does not support his claim and his calculations are based entirely on the particular assumptions he chose to make, which are not valid statistically.

23. Even if Prof. Arcidiacono could show that race had a greater impact on admissions decisions than do unobserved factors, such a showing would not address the question of whether race plays a dominant role in admissions. It is my understanding that the question is whether race plays a dominant or large role, *not* whether race plays no role or a role that is smaller than any other, arbitrarily small factor. Finally, in Section II.F, I describe how Prof. Arcidiacono’s models continue to contain the flaws that I described in my rebuttal report. These flaws make his models unreliable in assessing the likely outcomes of hypothetical race-blind alternative admissions plans.

24. At the outset, I note that, in several places in this report, as in my rebuttal report, I provide results based on Prof. Arcidiacono’s models of UNC’s admissions process. This should not be misconstrued as my acceptance that his models are accurate or reliable. As discussed in my rebuttal report, and again in this report, his models are not accurate and they are not reliable. I present these results merely to show in certain instances that, *even if one were to accept Prof.*

²⁸ Arcidiacono Rebuttal Report, pp. 16, 30, 32.

²⁹ Arcidiacono Rebuttal Report, pp. 22–28.

³⁰ Arcidiacono Rebuttal Report, p. 23.

³¹ Arcidiacono Rebuttal Report, pp. 8–11, 17–20.

³² Arcidiacono Rebuttal Report, p. 32.

Arcidiacono's models, which I do not, Prof. Arcidiacono's conclusions (and Mr. Kahlenberg's conclusions that depend upon these models) are not warranted.

A. Prof. Arcidiacono's Claimed Quantifications of the "Marginal Effect of Race" and the "Share [of Admissions Decisions] Due to Racial Preferences" Are Incorrect

25. In Tables 2.2 and 3.3 of his rebuttal report, Prof. Arcidiacono suggested that an applicant's probability of admission under his model of UNC's admissions decisions can be used to confirm the existence of "strong racial preferences."³³ Prof. Arcidiacono attempted to conduct such an analysis by examining the change in average admission probabilities in his admissions model (and in the model presented in my opening report) with and without the race indicators "turned on."³⁴ However, this analysis and these results do not measure the relative importance of race in admissions decisions.

26. Prof. Arcidiacono claimed to show "strong racial preferences" by calculating two quantities for African American and Hispanic applicants: the "marginal effect of race" and the "share due to racial preferences." He calculated the "marginal effect of race" for African American applicants by comparing the average admission probability for African American applicants to the average admission probability for African American applicants when the "African American" variable in his model is "turned off." He then calculated the "share due to racial preferences" for African American applicants by dividing the "marginal effect of race" by the average admission probability for African American applicants. For example, Prof. Arcidiacono claimed that the "share due to racial preferences" for in-state African American applicants is 41.7%.³⁵ However, this "share" is extremely misleading because it does not measure the relative importance of race among all factors that determine admissions decisions. His use of "%" and the word "share" implies that he is apportioning 100% of the admissions decision across various factors and that 41.7% of the 100% is due to racial preferences. But this is not the case.

27. To see how misleading Prof. Arcidiacono's calculations and conclusions are, one can use the same method to calculate, for example, the "marginal effect" of SAT scores or the "share due

³³ Arcidiacono Rebuttal Report, pp. 16, 30.

³⁴ Arcidiacono Rebuttal Report, pp. 16, 30.

³⁵ Arcidiacono Rebuttal Report, Table 3.3.

to” SAT score.³⁶ Doing so shows that the “effect” or “share” of SAT scores is essentially 100%, meaning that under Prof. Arcidiacono’s method, SAT scores entirely determine admissions decisions. But we know (and Prof. Arcidiacono’s own model suggests) that there are numerous determinants of admissions decisions other than SAT scores. This example highlights how Prof. Arcidiacono’s calculations of the “marginal effect of” and “share due to” race are misleading. Simply put, Prof. Arcidiacono’s “shares” are not, in fact, “shares.”

28. **Exhibit 1** shows the “shares” calculated using Prof. Arcidiacono’s preferred methodology for several of the factors in the Arcidiacono model. The shares due to these factors add up to substantially more than 100%, despite the fact that this table includes only nine main factors, a number far short of the 20 main factors (which correspond to many more coefficients due to several interaction terms) that are included in Prof. Arcidiacono’s models. Since it is impossible for shares of a whole to add up to more than 100%, this exhibit demonstrates that the values Prof. Arcidiacono has calculated are not “shares” at all. This is not a fine point but a serious symptom of the fact that Prof. Arcidiacono’s method is fundamentally flawed and not valid for testing the question that he claims it tests—the degree to which race “dominates” UNC admissions decisions.

³⁶ To “turn off” SAT in the same way that Prof. Arcidiacono “turns off” race, I assign all applicants the minimum value of the SAT among the applicants used in the estimation of his model. I also set the “missing SAT” indicator to zero for all applicants.

Exhibit 1³⁷
Arcidiacono Measure of “Share Due to” Various Factors,
Using Arcidiacono's Preferred Model
2011-12 to 2016-17 Admissions Cycles

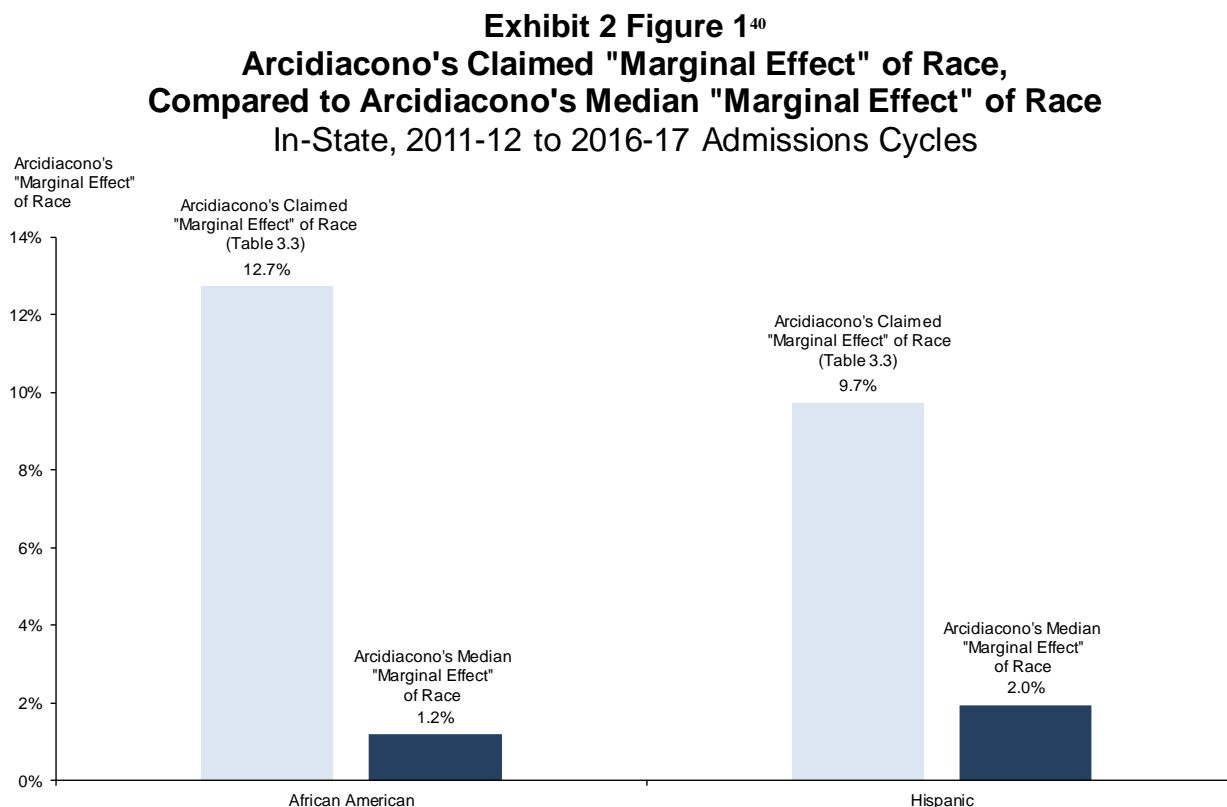
	African American Applicants	Hispanic Applicants	All Applicants
In-State Applicants			
"Share Due to" SAT Preferences	99.6%	99.8%	99.9%
"Share Due to" GPA Preferences	32.8%	30.6%	28.1%
"Share Due to" Percentile Preferences	30.8%	27.2%	23.6%
"Share Due to" Program Rating Preferences	51.3%	50.4%	49.5%
"Share Due to" Essay Rating Preferences	22.5%	20.8%	18.7%
"Share Due to" Personal Quality Rating Preferences	30.4%	28.1%	24.4%
"Share Due to" Activities Rating Preferences	38.5%	36.0%	33.7%
"Share Due to" Performance Rating Preferences	84.6%	85.8%	87.3%
"Share Due to" Race/Ethnicity Preferences	41.7%	23.8%	5.4%
Total	432.1%	402.5%	370.5%
Out-of-State Applicants			
"Share Due to" SAT Preferences	100.0%	100.0%	100.0%
"Share Due to" GPA Preferences	21.1%	25.8%	29.1%
"Share Due to" Percentile Preferences	46.4%	45.6%	49.9%
"Share Due to" Program Rating Preferences	14.9%	25.6%	29.8%
"Share Due to" Essay Rating Preferences	100.0%	100.0%	100.0%
"Share Due to" Personal Quality Rating Preferences	100.0%	100.0%	100.0%
"Share Due to" Activities Rating Preferences	36.5%	42.2%	51.2%
"Share Due to" Performance Rating Preferences	33.4%	48.0%	57.4%
"Share Due to" Race/Ethnicity Preferences	91.1%	70.2%	21.5%
Total	543.4%	557.4%	538.9%

29. In addition to the fundamental problem with Prof. Arcidiacono’s calculations shown in Exhibit 1, I also note that the numbers he calculates are not representative of most UNC applicants. To see this, I perform a version of Prof. Arcidiacono’s calculations of the “marginal effect of race” (although, as shown above, I do not agree with Prof. Arcidiacono’s interpretation of this quantity) in which I show the “effect” for the applicant with the *median* “marginal effect.” This is the applicant for whom half of applicants have a smaller “effect” and half have a larger “effect” (using Prof. Arcidiacono’s own measure of “effect,” which I do not accept).

30. **Exhibit 2** shows these median “marginal effects” and compares them to the “marginal effects” that Prof. Arcidiacono showed in his report. This exhibit illustrates the fact that Prof. Arcidiacono’s large putative “marginal effects of race” are driven by small numbers of students. That is, even if one were to adopt his measure of “marginal effect,” it still does not show what he claims it does because it is driven entirely by a small subset of applicants. For example, as

³⁷ See Exhibit 1 for sources and notes.

shown in Exhibit 2 Figure 1, while Prof. Arcidiacono estimated an average marginal effect of race for in-state African American students of 12.7%,³⁸ in fact the median marginal effect according to his methodology is 1.2%. Similarly, as shown in Exhibit 2 Figure 2, for out-of-state African American students Prof. Arcidiacono claimed a 15.6% effect,³⁹ but for the median out-of-state African American student his modeled effect is 0.6%. The results are similar for in-state and out-of-state Hispanic students. Thus, even using his own measure, the numbers Prof. Arcidiacono presented are misleading because they are driven by a small number of cases.



31. I also note that Prof. Arcidiacono's calculations of the "marginal effect of race" and "share due to racial preferences" are similar to the "transformation" examples that Prof. Arcidiacono presented in his opening report and I addressed in my rebuttal report.⁴¹ I demonstrated in my rebuttal report that Prof. Arcidiacono's transformation examples are unreliable because (i) they focus on a select group of students rather than the whole class;⁴² and

³⁸ Arcidiacono Rebuttal Report, Table 3.3.

³⁹ Arcidiacono Rebuttal Report, Table 3.3.

⁴⁰ See Exhibit 2 for sources and notes.

⁴¹ Arcidiacono Opening Report, pp. 43–48; Hoxby Rebuttal Report, ¶ 7.

⁴² Hoxby Rebuttal Report, ¶¶ 53–71.

(ii) the examples do not account for capacity constraints and—if applied to the whole class—would greatly overfill UNC’s actual student body.⁴³ The quantification that Prof. Arcidiacono provided in his rebuttal report in Tables 2.2 and 3.3 remains problematic for the same reasons as those transformation examples, but also suffers from the conceptual flaws described above.⁴⁴

B. Prof. Arcidiacono Overstated the Accuracy of his Model in Explaining UNC’s Admissions Decisions

32. As I explained in my opening report, I was asked to assess from an empirical perspective UNC’s assertion that it uses race as one factor among many that are evaluated on a holistic basis.⁴⁵ To do this, I tested whether UNC admissions decisions can be explained by a formula based on verifiable characteristics.⁴⁶ I tested this by analyzing the pseudo R-squared of several models of UNC admissions decisions that included all verifiable characteristics in the Connect Carolina data (UNC admissions data).⁴⁷ I found that all of the models I estimated did not perfectly explain UNC admissions decisions.⁴⁸

33. Thus, in my opinion, the data show that UNC does not use race in a formulaic way.⁴⁹ Nothing in Prof. Arcidiacono’s rebuttal analysis suggested anything to the contrary. That is, even if one accepts his modeling (which I do not), they do not show that UNC admissions are “formulaic” or that UNC considers race in a “formulaic manner.”

34. Prof. Arcidiacono claimed to arrive at a contrary conclusion on the basis that his model is highly “accurate” and concluded that “UNC’s in-state admissions are guided by an implicit formula.”⁵⁰ His claim is based on a comparison of the percentages of admitted students and rejected students that are correctly predicted by his model to the percentages of admitted and rejected students that would be correctly predicted by randomly drawing students via a process like a lottery. But there is no basis for his choice to measure accuracy by comparing the results

⁴³ Hoxby Rebuttal Report, ¶¶ 71–73.

⁴⁴ Hoxby Rebuttal Report, ¶ 47. I also reiterate the critiques of the Arcidiacono model I provided in my rebuttal report: Prof. Arcidiacono has not shown that the “racial preferences” he claims to be measuring reflect actual differences in how applicants are treated by UNC admissions staff.

⁴⁵ Hoxby Opening Report, ¶ 5.

⁴⁶ Hoxby Opening Report, ¶¶ 37–38, 47–52, 57–58.

⁴⁷ Hoxby Opening Report, ¶¶ 44–45, 52, 58.

⁴⁸ Hoxby Opening Report, Exhibit 1. Prof. Arcidiacono claimed that I made a “significant error in confusing” R-squared and pseudo R-squared. Arcidiacono Rebuttal Report, pp. 9–10. As I discuss in Section II.C, Prof. Arcidiacono is wrong.

⁴⁹ In my opening report, where I considered the race as a multiplicative factor model specifications, for example, the aim was not to argue that I was writing down *the* model that I thought best fit UNC’s admissions. The aim rather was to examine whether it could possibly be the case that UNC considers race in a formulaic manner. I found that it could not.

⁵⁰ Arcidiacono Rebuttal Report, p. 23.

of his model to a lottery or “random assignment.”⁵¹ Prof. Arcidiacono does not and, indeed, cannot suggest that UNC admits applicants at random. The question is whether UNC admits students in a way that can be captured by a formula. By comparing his model to random admissions, he seems to imply that admissions need be either formulaic (via his model or something close to it) or random. But these are not the only two possibilities—rather, UNC could be admitting students via a holistic review (consistent with the findings in my opening report), a possibility that Prof. Arcidiacono does not acknowledge. In this way, his method is analogous to showing that a color is not blue and then claiming that it must, therefore, be red when—in fact—it could be one of many other colors on the spectrum.

35. If the process were such that UNC admitted students according to a formula, Prof. Arcidiacono’s model would be able to predict admissions decisions *perfectly* because, as he has acknowledged, he had access to very detailed data.⁵² That is, the R-squared or pseudo R-squared, would be 1. In statistics, as in everyday life, we say that a prediction is accurate if it gets the answer right a very high percentage of the time, if not all of the time. We do not say that a prediction is accurate if it does not get the answer wrong as often as a random process would get it wrong. While there are a variety of measures of statistical accuracy, they are all based on whether a model gets the answer right.⁵³ Prof. Arcidiacono appears to use a definition of “accuracy”—namely, comparing to random assignment—that is not used in statistical applications where the question is whether a decision is formulaic. This is not an accepted measure in the relevant literature—i.e., studies that attempt to assess whether a decision is formulaic. Prof. Arcidiacono has not demonstrated that his measure of “accuracy” is preferable to R-squared or pseudo R-squared, which are used throughout the relevant literature. I previously showed that these, more standard, measures indicate that UNC’s admissions are not

⁵¹ Arcidiacono Rebuttal Report, pp. 24, 28.

⁵² Arcidiacono Rebuttal Report, p. 23.

⁵³ In a linear, ordinary least squares model, R-squared is the proportion of the total variability explained by the model. However, as explained in my opening report (Hoxby Opening Report, fn. 58), an admissions decision is a binary choice (admit/reject) that requires a nonlinear statistical model such as probit or logit. (This point is not disputed by Prof. Arcidiacono, who uses logit models.) In a probit or logit model, the estimates are obtained through an iterative maximum likelihood process. To evaluate the goodness-of-fit of such models, several pseudo R-squared measures have been developed that, like R-squared, are on a scale that ranges from 0 to 1 where 1 would indicate that the model explains 100 percent of the variation in the binary outcome (admit/reject). More generally, a higher value of a pseudo R-squared indicates that the model has a better fit or, put another way, predicts more accurately. I employ McFadden’s pseudo R-squared which is the default calculation in Stata (the statistical software that I, like many economists, use) because it is the most used or standard calculation. McFadden’s pseudo R-squared uses the same formula as R-squared except that the log likelihood of the intercept-only model is treated as a total sum of squares and the log likelihood of the full model is treated as the sum of squared errors. Thus, it is correct to interpret the pseudo R-squared as indicating the extent to which the model fits or explains the data (the admissions decision, in this case).

formulaic.⁵⁴ These measures are designed to show the extent to which an outcome (the admissions decision, in this case) is explained by a formula contained in the model under review and address the relevant questions.

36. In addition, I do not agree that Prof. Arcidiacono's models accurately capture UNC's admissions process or admissions decisions. As I discussed in my rebuttal report, his models are very overfit and their ability to predict admissions correctly is not nearly as high as he claims that it is (even if one accepts Prof. Arcidiacono's model, which I do not). By overfit, I mean that his model's predictions are substantially more erroneous out of sample than in sample. Overfitting is not a minor error but, rather, a fundamental error in any model that claims to be able to make predictions. I refer to the discussion in my rebuttal report of the overfitting problems in the Arcidiacono models, which remain present in the Arcidiacono rebuttal report models.⁵⁵

37. Prof. Arcidiacono's models and analysis have other limitations too—all of which have the effect of overstating his ability to capture UNC's admissions in a formula (which, nonetheless, he fails to do). For example, as in his opening report, he restricted the applicants he uses to fit his model, excluding 9,394 applicants whom UNC identified during its holistic review process as part of a "special recruiting category."⁵⁶ Once again, this exclusion of actual applicants made his model appear to predict more correctly than it actually does.⁵⁷

38. Prof. Arcidiacono also suggested that my modeling of UNC's holistic admissions process ought to have included the role of "subjective factors" such as UNC's summary ratings.⁵⁸ He stated, for example, that: "UNC's program rating...is more objective and formulaic than a grade in a high school English class ... and similarly more objective and formulaic than the score given on the writing portion of the SAT or ACT (both of which Professor Hoxby deems appropriate for inclusion in her analysis)."⁵⁹ While he is incorrect to state that the UNC admissions ratings are more objective than high school English class grades⁶⁰ or the writing scores on standardized

⁵⁴ Hoxby Opening Report, ¶¶ 52, 58.

⁵⁵ Hoxby Rebuttal Report, ¶¶ 92–96.

⁵⁶ Arcidiacono Rebuttal Report, p. 17, 24, 28; Arcidiacono Opening Report, pp. 65–67; Hoxby Rebuttal Report, ¶ 112.

⁵⁷ Hoxby Rebuttal Report, ¶ 112.

⁵⁸ Arcidiacono Rebuttal Report, p. 4.

⁵⁹ Arcidiacono Rebuttal Report, p. 6.

⁶⁰ A grade in a single class is the result of observation of that student over a long period of time on numerous assignments, based on comparison to many other students in the class.

tests,⁶¹ he also failed to recognize that I never included high school English class grades anywhere in my report (other than through inclusion in overall GPA), and I only included SAT writing in a single specification in my opening report.⁶² In any event, including or excluding these measures does not affect my conclusion that UNC admissions are not explained by a formula.

39. Prof. Arcidiacono himself recognized that it is not “literally true” that UNC admissions operations make decisions according to formulaic procedures, but claimed that the “formulaic elements” he modeled “dominate the actual outcomes.”⁶³ But he has no basis to claim that race is a “formulaic element.” He has simply assumed that it is. Suppose for example, that UNC considers the fact that someone plays the oboe as part of its process of holistic review. If Prof. Arcidiacono were to put that characteristic (“being a good oboe player”) into his model, he might find a large increase in admissions probabilities for good oboe players. But would that mean that “being a good oboe player” is a “formulaic element” in UNC admissions and that oboe players get a formulaic increase in admissions probabilities? No – it just means that being a good oboe player is one factor that is considered as part of holistic admissions and it just so happened that the few good oboe players were admitted as part of a holistic review. When, in some of his models, Prof. Arcidiacono includes every Census tract in a specification and finds that living in certain census tracts increases the admissions probabilities of associated students does that mean that “living in Census tract X” is a “formulaic element” in UNC admissions? Again, no. It just means that more students from that Census tract (relative to other Census tracts) happened to be admitted at UNC in the admissions cycle he is looking at (all else equal). That UNC is considering that variable he chooses to model *formulaically* is pure assertion or assumption on Prof. Arcidiacono’s part.

40. Contrary to Prof. Arcidiacono’s assessment, just because one can attach various estimated coefficients to a set of variables (e.g., “being a good oboe player,” “living in Census tract X”) does not mean one has actually captured UNC’s admissions process. In fact, the

⁶¹ The writing scores on standardized tests are based on extensive psychometric analysis, trials, and pre-testing on thousands of students. Ewing, Maureen et al., “SAT® Suite of Assessments Technical Manual Characteristics of the SAT,” *College Board*, (2017): 24, 60–62, 75–106.

⁶² Hoxby Opening Report, Exhibit 1 Tables 1 and 2.

⁶³ Arcidiacono Rebuttal Report, p. 24. “[T]he various characteristics of applicants can be assigned numerical scores and added up; those who are above some threshold are admitted, and the rest are rejected. Of course, this is not literally true: UNC admissions officers undoubtedly look at information that was not part of my analysis (e.g., letters of recommendation) and debate among themselves the merits of particular borderline candidates. But the formulaic elements I have modeled dominate the actual outcomes...”

relatively low values of the standard measures of fit when Prof. Arcidiacono's model is applied out of sample show that he has *not* captured the admissions process.⁶⁴

41. Prof. Arcidiacono claimed that his model predicts admissions decisions very accurately but this is not in fact true.⁶⁵ Recall that accurate means predicting correctly. It does *not* mean failing to predict as wrongly as random assignment. To the extent that his model does predict correctly, it does so largely because of academic factors and not race. In **Exhibit 3** I show that the "accuracy" of Arcidiacono's model (which I do not accept) on his own terms, with and without race. Using Arcidiacono's preferred measure, the "accuracy" for in-state admits increases by 1.1% when including race. Overall "accuracy" increases by 1.0%. Even if one uses Arcidiacono's own model and his own definition of "accuracy," calculations based on them do not support his conclusion that race is a dominant factor in UNC's admissions decisions.

Exhibit 3⁶⁶
Accuracy of Arcidiacono Model with and without Racial Preferences
2011-12 to 2016-17 Admissions Cycles

	"Accuracy" for Admits	"Accuracy" for Rejects	Overall "Accuracy"
In-State Applicants			
Arcidiacono's Preferred Model with "Racial Preferences" [2]	91.8%	92.5%	92.1%
Arcidiacono's Preferred Model without "Racial Preferences" [3]	90.7%	91.5%	91.1%
Difference in "Accuracy" (with "Racial Preferences" – without "Racial Preferences")	1.1%	1.0%	1.0%
Out-of-State Applicants			
Arcidiacono's Preferred Model with "Racial Preferences" [4]	75.4%	96.1%	93.3%
Arcidiacono's Preferred Model without "Racial Preferences" [3]	68.3%	95.0%	91.4%
Difference in "Accuracy" (with "Racial Preferences" – without "Racial Preferences")	7.1%	1.1%	1.9%

C. Prof. Arcidiacono's Claim That I Made a "Fundamental Mistake" in Interpreting the Pseudo R-squared of the Model in My Opening Report is Unfounded and Misleading

42. In my opening report, I reported measures of fit that indicate that UNC's admissions decisions are not formulaic and that race is not dominant in admissions.⁶⁷ I continue to opine that the levels of pseudo R-squared of the models in my opening report demonstrate that UNC's admissions decisions are not formulaic.

43. Technically, the measures I reported in my opening report were "pseudo R-squared" statistics, though in some places, I referred to these colloquially as "R-squared." Prof.

⁶⁴ Hoxby Rebuttal Report, ¶¶ 102–105.

⁶⁵ Arcidiacono Rebuttal Report, pp. 22–23.

⁶⁶ See Exhibit 3 for sources and notes.

⁶⁷ Hoxby Opening Report, ¶¶ 47–58.

Arcidiacono seizes on one paragraph in my opening report, which was meant to be an intuitive explanation of model fit, and interprets it as if I were claiming to report R-squared rather than pseudo R-squared. In fact, my opening report specifically includes the qualifier “roughly speaking” to indicate that this discussion was not a technical description and the fact that my results showed “pseudo” R-squared values was a clear implication of the non-linear models I described in my opening report.⁶⁸ See footnote 53 for a more detailed description of R-squared and pseudo R-squared.

44. On a more substantive basis, Prof. Arcidiacono provided no justification for his claim that the levels of pseudo R-squared of the models presented in my opening report are high enough to conclude that UNC admissions are formulaic. Prof. Arcidiacono cited McFadden (1979) on this point. But this citation applies to an entirely different context (a completely different application of non-linear modeling) and says nothing about what an “excellent fit” would be in the context of evaluating whether a process is formulaic.⁶⁹ By definition, a process is formulaic if it is based on a formula and the definition of formula is “A mathematical relationship or rule expressed in symbols.”⁷⁰ If UNC admissions decisions were in fact formulaic, there would be some statistical model that would have pseudo R-Squared of 1 or 100%. Prof. Arcidiacono pointed to no such results.

45. As I noted in my opening report, and which Prof. Arcidiacono has not contradicted, an accepted method of assigning importance to the explanatory power of certain factors is to decompose a standard measure of goodness of fit, such as R-squared or pseudo R-squared, thereby quantifying how much a factor (or set of factors) accounts for fit (or accuracy).⁷¹ I show decompositions like this in my opening and rebuttal reports.⁷² In fact, I showed in my opening report that the proportion of admissions models’ (pseudo) R-Squared due to test scores was an order of magnitude larger than the proportion due to race/ethnicity: test scores accounted for 23–33% of pseudo R-squared while race/ethnicity accounted for only 2.8–3.5%.⁷³ If the standard

⁶⁸ Hoxby Opening Report, ¶ 44, fn. 58.

⁶⁹ Arcidiacono Rebuttal Report, p. 10 (quoting McFadden, Daniel, “Quantitative Methods for Analyzing Travel Behavior: Some Recent Developments,” in *Behavioral Travel Modeling*, edited by David A. Hensher and Peter R. Stopher, Croom Helm Ltd., 1979): “Those unfamiliar with the ρ^2 index should be forewarned that its values tend to be considerably lower than those of the R^2 index and should not be judged by the standards for a ‘good fit’ in ordinary regression analysis. For example, values of 0.2 to 0.4 for ρ^2 represent an excellent fit.”

⁷⁰ “Formula,” *Oxford English Dictionaries*, <https://en.oxforddictionaries.com/definition/formula>, accessed June 6, 2018.

⁷¹ Hoxby Opening Report, ¶ 46.

⁷² Hoxby Opening Report, Exhibit 1 Table 1, Exhibit 1 Table 2. Hoxby Rebuttal Report, Exhibit 1.

⁷³ Hoxby Opening Report, Exhibit 1 Table 1.

procedure (Shapley decomposition) is applied to the Arcidiacono model, as I noted in my rebuttal report, one gets similar results.⁷⁴ Thus, no matter whether my or Prof. Arcidiacono's model is used, standard empirical analysis that Prof. Arcidiacono does not challenge shows that race plays a very small role in determining outcomes in UNC's overall admissions decisions.

46. It is worth noting that the standard procedure (Shapley decomposition) calculates proportions or shares that add up to 100% across all factors in the model, unlike Prof. Arcidiacono's supposed "shares," which I discussed earlier. This is because the standard procedure has a proper statistical basis whereas Prof. Arcidiacono's method does not.

D. Prof. Arcidiacono's Claims About "Errors" or Alternative Modeling Assumptions That I Should Have Used in Modeling UNC Admissions in My Opening Report Have No Effect on My Overall Conclusions

47. Prof. Arcidiacono claimed that the admissions models presented in my opening report "miss key components of the analysis that tend to understate the effect of racial preferences."⁷⁵ Prof. Arcidiacono argued for the following alternate modeling choices: (1) that the in-state and out-of-state admissions processes should be modeled separately; (2) that models of UNC's admissions should include the subjective ratings variables; (3) that models of UNC's admissions should ignore foreign students and students from categories with a high likelihood of admission; (4) that an indicator of first-generation college status should be included; (5) and that the model should be estimated over an additional two more years of data that I did not include in my analysis in my opening report (Hoxby Opening Report, Exhibit 1).⁷⁶ Even though I do not agree that these changes are necessarily appropriate or correct, if I make them, they do not alter any of my conclusions.

48. Indeed, even after making these changes, as is reflected in **Exhibit 4**, the share of admission decision due to race/ethnicity (even in the most expansive "race as multiplicative factor" model⁷⁷) is never higher than 8.9% when one does not include ratings variables and never

⁷⁴ Hoxby Rebuttal Report, ¶ 18.

⁷⁵ Arcidiacono Rebuttal Report, p. 16.

⁷⁶ Arcidiacono Rebuttal Report, pp. 16–20. He also suggests that one should exclude incomplete or withdrawn applications, that my coding of the early action variable was incorrect, and that one should exclude the parents' education variable (for which the coding was inconsistent over time).

⁷⁷ In these multiplicative-factor regressions, every variable is allowed to count differently for applicants who are URMs. For instance, a student's SAT combined score may count differently for URMs versus others. Moreover, the multiplicative factor that allows each of these variables (the SAT score, etc.) to exercise a different influence for URMs versus others is allowed to change from variable to variable. See Hoxby Opening Report, ¶ 57.

exceeds 11.2% when one includes ratings variables. Consequently, the ensuing opinion presented in my opening report remains valid: race and ethnicity are not dominant factors in UNC's admissions decision.⁷⁸

E. Prof. Arcidiacono's Statements about the Size of Unobservables are Driven Entirely by His Assumptions and Not by the Data and They Say Nothing about Whether Race is a Dominant Factor in Admissions Decisions

49. Prof. Arcidiacono claimed that he is able to “show that racial preferences are substantially more important than unobserved factors and thus has an outsize impact on admissions decisions.”⁷⁹ This statement is misleading for a number of reasons.

50. First, “unobserved factors” are not some set of student characteristics. The phrase “unobserved factors” is just a name for what one's model does *not* explain. Put another way, “unobserved factors” are just what is left over once one has taken account of the factors one chooses to include in one's model.

51. Prof. Arcidiacono's conclusion that racial preferences have “an outsize impact on admissions decisions” does not logically follow from his premise. His conclusion is a claim about the role of race in admissions decisions. In other words, it is a claim about the *share* of the admissions decision that is explained by race. Yet the first part of Prof. Arcidiacono's sentence is about racial preferences being “more important than unobserved factors.” Such evidence (even if it were based on a valid model) is irrelevant to the question of how much of the admissions decision is explained by race.

52. Second, as I discussed in my rebuttal report, Prof. Arcidiacono's model is very overfit because it includes a large number of dummy and interaction variables, which do not capture the UNC admissions process.⁸⁰ The mechanical effect of including these dummy variables is that one's model appears to explain the admissions decision when it really does not. Evidence of this serious overfitting is that Prof. Arcidiacono's model fits the data well in-sample but predicts badly out-of-sample.⁸¹ Overfitting is a fundamental error for any model being used for prediction. It is not a minor error or fine point.

⁷⁸ Hoxby Opening Report, ¶ 56.

⁷⁹ Arcidiacono Rebuttal Report, p. 32.

⁸⁰ Hoxby Rebuttal Report, Section IV.D. These dummy and interaction variables include race interacted with: missing GPA, missing percentile, irregular rank type, gender and first generation college status. They also include indicators for High School ID and indicators for Census Tract (wrongly identified, as explained in my rebuttal report). See Hoxby Rebuttal Report, fn. 83, ¶¶ 100–101.

⁸¹ Hoxby Rebuttal Report, ¶¶ 102–105.

53. By using overfit models contrary to statistical standards, Prof. Arcidiacono can make the unobserved factors as arbitrarily small as he wants. Thus, not only is Prof. Arcidiacono's comparison of race to unobserved factors dependent upon an illogical assumption, it is not a meaningful comparison since Prof. Arcidiacono can essentially set the bar wherever he likes. Thus, Prof. Arcidiacono's "test" is not valid or reliable.

54. Furthermore, Prof. Arcidiacono's claimed quantification about "unobserved factors" is based entirely on his assumption that the "unobservables" are uncorrelated (i.e., have a correlation of *zero*) with the characteristics of students that are included in the model. Prof. Arcidiacono provided no basis for this very strong assumption. As a logical matter, Prof. Arcidiacono's claim *must* be unfounded because if he could observe the "unobservables" (as a basis for making the assumption), then they would not be unobservable.

55. Moreover, as I discussed in my rebuttal report, the nature of selective admissions makes it likely that the unobservable characteristics are negatively correlated with the observable ones.⁸² This is because, if the unobservable characteristics are relevant for admissions decisions, one would expect admitted students at UNC to be "selected" in part on unobservable characteristics. That is, students with relatively low levels of observable characteristics, such as test scores and grades, would be more likely to apply to, and be admitted by, UNC when they have relatively high levels of unobservables (e.g., they are especially good leaders or have overcome particularly difficult circumstances). The fact that selective admissions leads to a negative correlation between observables and unobservables is commonly accepted among economists who study college admissions and also commonly accepted for numerous similar applications (such as being selected from a pool of job applicants).

56. Summing up, Prof. Arcidiacono's comparison is not a valid test because it does not make logical sense, employs overfit models, and is dependent upon his specific modeling choices. Further, even if it were a valid test, this type of comparison sheds no light on the relative importance of race/ethnicity in admission decisions.

⁸² Hoxby Rebuttal Report, ¶ 80.

F. Prof. Arcidiacono's Models Continue to Contain the Flaws that I Described in My Rebuttal Report Which Make His Models Inappropriate to Use in Assessing the Likely Outcomes of Hypothetical Race-Blind alternative Admissions Plans

57. As described in my rebuttal report, Prof. Arcidiacono's admissions models are not an appropriate basis for analysis of alternative admissions plans, as they rely on improper assumptions and contain errors.⁸³ Those errors remain present in his rebuttal report analysis. Prof. Arcidiacono continued to estimate his models using only UNC's actual applicants, despite evidence that changes in universities' admissions plans result in significant changes in their applicant pools.⁸⁴ Because his models rely on factors, such as UNC's ratings variables, which are only available for past applicants, it is incorrect to use his models to predict admissions for future applicants.⁸⁵ Moreover, as explained in my prior reports, including these variables is inappropriate and leads to biased predictions because (1) they are not verifiable and (2) they are not independent from race (in the language of economics, they are "endogenous").⁸⁶

58. Moreover, Prof. Arcidiacono continued to exclude from his analysis any student identified in UNC's holistic admissions process as belonging to a "special recruiting category," such as having certain special talents or eligibility for certain scholarships.⁸⁷ This is an inappropriate modeling choice because UNC considers these students' applications as part of its holistic review of all applicants.⁸⁸

59. Prof. Arcidiacono's models remain overfit, and therefore may appear to fit the sample data but do not produce reliable future predictions (which are essential in modeling future admissions plans). As in his opening report, Prof. Arcidiacono continued to use many race-specific variables in constructing his models. He allowed factors such as having an irregular rank type or a missing GPA to have different impacts for students of any given race.⁸⁹ This has the effect of singling out the admissions outcomes of the very few students that meet the combination of a given set of characteristics, rather than providing an appropriate estimator of the true impact (if any) of having that set of specific factors. Future predictions would reflect the

⁸³ Hoxby Rebuttal Report, Section IV.

⁸⁴ Hoxby Rebuttal Report, ¶¶ 83–87.

⁸⁵ Hoxby Rebuttal Report, ¶¶ 88–91.

⁸⁶ Hoxby Rebuttal Report, ¶¶ 107–111.

⁸⁷ Arcidiacono Rebuttal Report, p. 17.

⁸⁸ Hoxby Rebuttal Report, ¶¶ 112–114.

⁸⁹ Arcidiacono Rebuttal Report, Table A.4.1.R, Table A.4.2.R.

admissions outcomes of the few students from within this particular sample who had that set of factors, but these predictions would be unreliable because future applicants may be different.⁹⁰

60. Likewise, throughout his rebuttal report, Prof. Arcidiacono continued to “turn off” race variables or report admissions probabilities “without racial preferences,”⁹¹ when in fact allowing race variables to remain in the model. He does this including variables that are broken out by applicants’ races. As a result, when Prof. Arcidiacono (or Mr. Kahlenberg) claimed to have “turned off” race variables or make admissions predictions “without racial preferences,” he was actually relying on models that still “turn on” variables that incorporate the race/ethnicity of students. Thus, the admissions predictions he calculates do not, in fact, have race “turned off.”⁹²

III. Mr. Kahlenberg’s New Simulations and Unsupported Claims about Potential Strategies Do Not Provide Evidence of the Existence of a Workable Race-Blind Alternative for UNC

61. In my opening report, I tested several simulations of race-blind admissions plans that were based on Mr. Kahlenberg’s published writings mentioned in the Complaint. In my rebuttal report, I analyzed the five simulations suggested by Mr. Kahlenberg in his opening report and showed that they were misconceived and not valid predictions of what would occur if UNC were to try to adopt his suggested race-blind plans. In addition, I assessed several suggestions made by Mr. Kahlenberg in his opening report and showed them to be unsupported by facts, evidence, or knowledge of realistic implementation issues. A comprehensive review of all of my analyses suggests that there is no race-blind alternative available to UNC that could be used, even in some practical combination with another alternative, that would allow UNC to maintain its current level of academic preparedness and racial diversity.

62. In this report, I analyze the new simulations presented by Mr. Kahlenberg in his rebuttal report and assess his new suggestions and find that they do not show that there exists a workable race-blind alternative plan that would allow UNC to achieve its goals.

⁹⁰ Hoxby Rebuttal Report, ¶¶ 92–105.

⁹¹ Arcidiacono Rebuttal Report, Table 3.3, Table 3.4, Table 3.6.

⁹² Hoxby Rebuttal Report, ¶ 115.

A. Many of Mr. Kahlenberg's Suggestions Do Not Address the Relevant Questions and Could Not be Implemented by UNC

63. As with his opening report, Mr. Kahlenberg's report and opinions continued to be colored by his clear preference for and desire to increase socioeconomic diversity.⁹³ I understand the question at issue to be whether there is a workable alternative that would allow UNC to maintain racial diversity while also maintaining its academic standards. As I explained in my opening report, socioeconomic proxies might be used in admissions to increase socioeconomic diversity.⁹⁴ But if a university attempts to use socioeconomic proxies to achieve *racial* diversity, the university always suffers costs along other dimensions that it cares about in admissions because the correlation between socioeconomic variables and race is not as high as Mr. Kahlenberg asserts.⁹⁵ Rather than engage with this point, Mr. Kahlenberg dismissed it as "pedestrian."⁹⁶

64. In fact, the point is absolutely central to the question at issue: can UNC use a race-blind admissions process without sacrificing academic preparation, racial diversity, or both? The lower the correlation between socioeconomic proxies and race/ethnicity, the greater the sacrifices that a race-blind alternative plan imposes on the University. This is not assumption but fact. Thus, one must assess the scale of the sacrifices—*quantitatively*. My analysis revealed that the sacrifices are large.⁹⁷ This large magnitude of the sacrifice is due to the fact that socioeconomic status ("SES") is only weakly correlated with race, especially among academically well-prepared students who are the target population of selective colleges like UNC.

65. Mr. Kahlenberg suggested that the damage might be mitigated if the university were to collect more or better data.⁹⁸ However, Mr. Kahlenberg did not grapple with the question of how the university could do this. Indeed, since my analysis already used data from an array of the most informative sources, Mr. Kahlenberg's suggestion amounts to an assertion that UNC could collect more and better data than the combined forces of the North Carolina Department of Public Instruction, the U.S. Bureau of the Census, the U.S. Department of Education, and several other statistical agencies. Such an assertion, made without support, does not provide evidence

⁹³ Hoxby Rebuttal Report, ¶¶ 181–182.

⁹⁴ Hoxby Opening Report, ¶ 134.

⁹⁵ Hoxby Rebuttal Report, ¶ 181.

⁹⁶ Kahlenberg Rebuttal Report, p. 11.

⁹⁷ Hoxby Opening Report, ¶¶ 147, 156.

⁹⁸ Kahlenberg Report, Section V.A.1. Kahlenberg Rebuttal Report, pp. 55–56.

that a hypothetical race-blind plan would be workable. That is, it does not account for how such a plan would actually be implemented.

66. Mr. Kahlenberg further asserted that UNC could implement a broader definition of socioeconomic status by considering the *wealth* of its applicants rather than just their family income.⁹⁹ This assertion is wholly without foundation, as I noted in my rebuttal report. Such individual wealth data are not only not available to UNC, they are not possessed even by the Internal Revenue Service or Federal Student Aid (the division of the U.S. Department of Education that administers grants and loans).¹⁰⁰ Again, such an assertion is not grounded in the facts regarding what UNC could actually work with in implementing any hypothetical plan.

67. In addition to making suggestions about hypothetical race-blind strategies that are not founded in facts, Mr. Kahlenberg also made the unsubstantiated claim that some combination of race-blind strategies might be used to attain UNC's goals.¹⁰¹ He provided no detail about how this would occur or what that combination would be. But such a claim, without substantiation or specifics, does not provide evidence of a workable race-blind alternative for UNC: indeed (1) some of the race-blind strategies are not mutually consistent with one another and (2) I previously provided a "Race Predicting Index" that demonstrated the upper bound on what could be achieved by a large set of possible combinations of SES-based strategies.¹⁰²

68. With respect to the first point (that some race-blind strategies are not mutually consistent with each other), in my opening report, I considered race-blind plans based on (i) socioeconomic status,¹⁰³ (ii) class rank in high school,¹⁰⁴ and (iii) geography,¹⁰⁵ and I found that all of these plans would result in a predicted set of admitted students and a predicted entering class with lower academic preparedness, fewer underrepresented minorities ("URMs"), or both, relative to the students UNC is actually able to admit and enroll using its current admissions plan. One by one, I assessed in detail how each plan might actually be implemented and I tried to reveal the mechanisms driving the results. I considered the plans one at a time partly to make these demonstrations clear. However, I also considered the plans one at a time because they cannot, in fact, be implemented in a mutually consistent way. For instance, if students with a certain class

⁹⁹ Kahlenberg Rebuttal Report, pp. 55–56.

¹⁰⁰ Hoxby Rebuttal Report, ¶¶ 173–178.

¹⁰¹ Kahlenberg Rebuttal Report, p. 5.

¹⁰² Hoxby Opening Report, ¶¶ 210–217.

¹⁰³ Hoxby Opening Report, Section V.

¹⁰⁴ Hoxby Opening Report, Section VI.

¹⁰⁵ Hoxby Opening Report, Section VII.

rank are guaranteed admission (as in a Top X Percent plan), some of them will inevitably be socioeconomically advantaged—a fact that would conflict with plans that favor the socioeconomically disadvantaged. Another example is the geographic plans referenced by Mr. Kahlenberg, which inevitably guarantee admission to many advantaged students and are therefore not easily reconciled with plans that favor the socioeconomically disadvantaged.

69. Despite these conflicts, Mr. Kahlenberg suggested that if UNC were somehow to combine all three types of plan (socioeconomic status, class rank, geography), the University could—by some unspecified process—evade the sacrifices imposed by the individual race-blind alternatives. But Mr. Kahlenberg made no attempt to specify how the conflicts among the disparate plans would be resolved or any attempt to demonstrate either the mechanics or results of an actual implementation.

70. Similarly, Mr. Kahlenberg claimed that UNC has available to it a large number of potential race-blind admission strategies that would allow the school to attain its diversity goals without experiencing sacrifices along the other dimensions it cares about in admissions. However, Mr. Kahlenberg has not actually assessed whether these race-blind strategies would be workable alternatives to UNC’s current admissions process: he does not ground them in facts; he does not grapple with issues of implementation; he does not provide specifics that could be tested or compared to data; and he does not support most of his suggestions with analysis.

71. With respect to the second point, in my opening report, I provided a demonstration that refutes the existence of a race-blind plan “just over the horizon” that would allow UNC to experience no sacrifices on academics or racial diversity or both.¹⁰⁶ Specifically, I sought to construct and analyze a socioeconomic index that is designed to be as successful of a proxy for race and ethnicity as it mathematically could be (the “Race Predicting Index”). To construct the Race Predicting Index, I used a regression to estimate a model that predicts URM status based on the most extensive set of socioeconomic variables available. Using such an index would allow UNC to get as close as possible to attaining its current levels of academics and racial diversity while conducting admissions that were race-blind *on the surface*.¹⁰⁷

¹⁰⁶ Hoxby Opening Report, ¶¶ 210–217.

¹⁰⁷ Hoxby Opening Report, ¶¶ 210–217. In my opening report, I emphasize that this Race Predicting Index is not truly race-blind. Rather, it is an exercise: a demonstration of what could possibly be attained by an admissions process that wanted to have the appearance of race blindness.

72. The Race Predicting Index analysis in my opening report showed the most favorable results that an on-the-surface race-blind plan could achieve. But even this approach would not allow UNC to maintain its current level of academic preparedness and racial diversity of its incoming students. Mr. Kahlenberg did not address this analysis in his rebuttal report. Therefore, I continue to opine that the Race Predicting Index I analyzed provides an upper bound—or best case scenario—for what any proposed socioeconomic status-based plan might achieve.

B. Mr. Kahlenberg Has Not Provided Evidence of a Workable Race-Blind Alternative That Would Allow UNC to Maintain its Racial Diversity While Also Maintaining its Current Academic Standards

73. Most of Mr. Kahlenberg’s claims regarding race-blind admission strategies are unspecific. However, he did suggest a few new SES-based and Percentage Plans in his rebuttal report that are sufficiently specific to be analyzed. He claimed that these alternatives would allow UNC to attain its diversity goals without sacrificing academic preparedness and other dimensions it cares about in admissions. In this section, I show that this claim is false by analyzing each of the new SES-based and Percentage Plans that Mr. Kahlenberg suggests in his rebuttal report.

1. Mr. Kahlenberg’s New SES Plans Are Not Workable Alternatives for UNC

74. Mr. Kahlenberg presented two new SES-based plans: one is based on a type of plan that I analyzed in my opening report and the other is “Simulation 6,” which is based on Simulation 4 in the Kahlenberg Report.¹⁰⁸ Mr. Kahlenberg’s version of the plan that I analyzed in my opening report (which I call the “Kahlenberg SES seats plan”) is not reliable because it makes unrealistic assumptions about the students UNC could admit and matriculate under the plan. Mr. Kahlenberg’s Simulation 6 is not reliable because, as I described in my rebuttal report, it gives such large increases in admission probabilities (“bumps”) to students whom Mr. Kahlenberg deems low SES that it effectively removes UNC’s holistic review and replaces it with a formulaic approach based almost entirely on socioeconomic status.

¹⁰⁸ Kahlenberg Rebuttal Report, pp.41–47.

75. First, in considering the Kahlenberg SES seats plan, I note that the analysis of the analogous plan in my opening report was constructed to be maximally favorable to the race-blind plan in two key ways:¹⁰⁹

- i. It assumed (i) that UNC could identify the “disadvantaged” students that it would like to admit, (ii) that UNC could get them to apply, and (iii) that UNC would choose to admit the highest-scoring students among those applicants. These assumptions are overly favorable to the race-blind plan because, in reality, UNC could not identify all of these students, could not force them to apply, and considers many aspects of applicants’ profiles other than test scores.¹¹⁰
- ii. It also assumed that highly qualified students would continue to apply even if their chances of admission fell substantially under the alternative plans. This assumption is overly favorable to the race-blind plan because, in fact, students are less likely to apply if they believe that they are less likely to be admitted.¹¹¹ Assuming that these students would continue to apply greatly favored the alternative race-blind plans since these alternative plans would actually make having low SES much more important for a student’s chance of admission and make all other factors much less important. In reality, the academic qualifications and racial/ethnic diversity of the applicant pool would likely fall under an SES-based plan—resulting in an entering class that was less qualified, less racially diverse, or both.

76. I made these overly favorable assumptions in part of my opening report’s analysis of SES-based plans for an important reason: they show that even under these overly favorable conditions, UNC could not realistically expect that this alternative admissions process (which covers non-disadvantaged students as well, of course) would result in a class that was as academically prepared and racially diverse as its current class. I used UNC’s *own process* to complete the class¹¹²—thereby hewing as closely as possible to UNC’s actual holistic process in

¹⁰⁹ Hoxby Opening Report, ¶ 176. “I use assumptions that are very favorable to the alternative (socioeconomic status-based) admissions plan... Specifically, I assume that UNC: (i) is able to consider all of the students who are classified as disadvantaged as potential applicants; (ii) admits the highest-scoring disadvantaged students, in order, from the disadvantaged pool, up to the number given by the emphasis...”

¹¹⁰ Hoxby Opening Report, ¶ 177.

¹¹¹ See Hoxby Opening Report, ¶ 84.

¹¹² The “completing the class” stage answers the question of whether it is possible for UNC to attain its current actuals levels of academic preparedness and diversity by admitting non-disadvantaged students to add to the disadvantaged students admitted based on SES. See Hoxby Opening Report, ¶ 182.

considering which other applicants UNC would be likely to admit. That is, in my analysis of SES based plans, although I made assumptions that were maximally favorable to the race-blind alternative, I still sought to use information from UNC's actual admissions decisions when possible.

77. In contrast, Mr. Kahlenberg took a different—highly unrealistic—approach. Mr. Kahlenberg's change to the SES based plan in my opening report is the following: he deletes the realistic completing-of-the-class based on UNC's actual admissions decisions and substitutes for it an assumption that UNC could enroll *all* the students who rank highest on SAT scores and GPAs (specifically, on Arcidiacono's SAT/GPA index). He also assumes these students would enroll *regardless of whether or not they were actually admitted by UNC*. That is, he replaces UNC's holistic admissions with a formulaic admissions process that looks only for the highest test scores and GPAs.¹¹³ This substitution stacks the deck in favor of finding students with relatively high test scores and it also does not answer the critical question: could UNC combine an SES plan with its current holistic admissions process to achieve a class that was both academically prepared and racially diverse? By removing any consideration of UNC's holistic review, Mr. Kahlenberg's SES seat simulation does not present a reliable or realistic answer to this question.

78. Mr. Kahlenberg also presents another SES-based plan, which he calls "Simulation 6".¹¹⁴ This is a variant of Simulation 4 in Mr. Kahlenberg's opening report and this simulation inherits all of the errors of the original KA Simulations. In particular, as I described in my rebuttal report, it provides such large increases in admissions probabilities ("bumps") for students whom Mr. Kahlenberg deems low SES that the SES index effectively displaces UNC's holistic admissions process. Recall that Mr. Kahlenberg's SES bumps are so large that they are worth as much or more in admissions as a student's SAT score going from a bottom score to a top score—in Simulation 4, a socioeconomically disadvantaged student (a student who qualifies for Mr. Kahlenberg's three bumps) would have the equivalent of 834 SAT points added to his actual score.¹¹⁵ SES bumps of this size are not only ungrounded in reality (they would change the very nature of UNC admissions), they would also effectively preclude UNC from considering many

¹¹³ On average 79% of the students admitted in Mr. Kahlenberg's "completing the class" portion of the class were actually admitted. That is, 21% of Mr. Kahlenberg's "completing the class" admits are students who UNC did not actually admit via its holistic review.

¹¹⁴ Kahlenberg Report, p. 51.

¹¹⁵ Hoxby Rebuttal Report, Exhibit 7.

of the factors that it currently considers on a holistic basis as part of determining which applicants would be a good fit for UNC.

79. Also, for the same reasons that I described in my rebuttal report with respect to Simulation 4, Mr. Kahlenberg's Simulation 6 failed to account for the fact that highly qualified students would be less likely to apply to UNC under an admissions plan that used Mr. Kahlenberg's outsized SES bumps. Since, with his bumps, SES-based disadvantage would so dominate the admissions process that academic preparation would hardly be valuable, applications from well-prepared students would almost assuredly fall off. But Mr. Kahlenberg assumed that *no changes* in applicant behavior would occur in his Simulations 4 and 6.^{116, 117}

2. Mr. Kahlenberg's New "Percentage Plan" Contains the Same Fundamental Flaws as the Plan Considered in his Opening Report

80. Mr. Kahlenberg presented a new simulation of a "Percentage Plan" that contained the same fundamental flaws as the simulations in his opening report.¹¹⁸ In particular, Mr. Kahlenberg's simulated Percentage Plan is based only on students who *already apply* to UNC.¹¹⁹ But, as discussed in my rebuttal, a simulation based only on students who already apply does not allow one to reliably estimate the effects of the plan. This is because, under a Percentage Plan, a whole new set of students would be *guaranteed* admission and—as a result—a good share of them would apply. If Mr. Kahlenberg took account of their applying (and changing the applicant pool thereby), his simulated Percentage Plan could not attain anything like the academic preparedness and racial diversity of UNC's current class. Mr. Kahlenberg presented no evidence to support the choice to restrict his simulation to students who already apply.

81. Mr. Kahlenberg also criticized the version of the "Percentage Plan" (or "Top X Percent" plan) that I analyzed in my opening report. He suggested that I did not sufficiently adjust test scores between the UNC applicant data and NCERDC to make an "apples to apples" comparison

¹¹⁶ Hoxby Rebuttal Report, V.A–V.B.

¹¹⁷ In this Simulation, Mr. Kahlenberg "turned off" "preferences" for children of faculty. This is another example of how these simulations misinterpret the coefficients in the Arcidiacono models. What Mr. Kahlenberg appeared to claim are "preferences provided to the children of faculty members" do not actually measure "preferences", but likely proxy for other characteristics of these students that are likely to make them successful and admissible at UNC.

¹¹⁸ I note that in this proposal, Mr. Kahlenberg steered away from the bespoke "Top Percent" plans suggested in his opening report.

¹¹⁹ He imposed this restriction by using only students who appear (are matched) in both the UNC applicant data and the NCERDC data.

between the actual UNC admitted class and the hypothetical admitted class under the percentage plan.¹²⁰ I disagree. My test score adjustment is based on ACT's own analysis (and therefore, the organization's complete internal data on test-takers). Nevertheless, to show that Mr. Kahlenberg's concern does not affect my conclusions, I run the Top X% Plan from my opening report but with the following adjustment: for students for whom a test score is available in the UNC applicant data, I use that test score. For all other students, I continue to use the NCERDC test score, adjusted upwards to account for the average increase in score due to test retaking (based on the ACT research). **Exhibit 5** shows the resulting Top X% Plan, which is almost identical to the results I showed in my opening report. The conclusion from my opening report is confirmed: the Top X% Plan would result in a matriculating class with substantially lower average test scores than the actual UNC matriculating class, and Mr. Kahlenberg's criticisms of score adjustment have essentially no impact on the results I showed in my opening report.

3. Mr. Kahlenberg Misunderstands the Presentation of the Results of the Allen-Based Geography Plan in My Opening Report (the Census Tract Plan)

82. In my opening report I described the substantial challenges in implementing a geography-based plan along the lines of the plan to which the Complaint alludes.¹²¹ To reiterate, a geography-based plan like that alluded to in the Complaint and described by Danielle Allen is (i) purely hypothetical (in other words, no highly selective university has implemented such a plan) and (ii) contains numerous implementation issues that makes its intentions differ from how it would work in reality. Most importantly, the logical basis for a geography-based plan is the notion that a small geographic zone's historical admissions rate would be highly predictive of a current student's probability of UNC admission.¹²² If this notion were true, geography would serve as a sort of proxy for disadvantage in admission. However, I showed that it is not the case empirically that a small geographic zone's historic admissions rate is predictive of a current student's admission to UNC.¹²³ Therefore, the facts do not fit the logic on which the geography-based plan was founded. In addition, it is not feasible to use ZIP+4 codes as the basis of the

¹²⁰ Kahlenberg Rebuttal Report, p. 48.

¹²¹ Hoxby Opening Report, ¶¶ 238, 243.

¹²² Hoxby Opening Report, ¶ 243.

¹²³ Hoxby Opening Report, ¶ 243.

plan, as suggested by Allen, since the number of ZIP+4 codes is far too large.¹²⁴ As a result, I implemented the plan suggested by Allen as best I could with the data. I called this a “Census tract” plan since it relies upon the applicant’s Census tract.

83. Mr. Kahlenberg claimed that I “was incorrect to reject the Census tract approach” based on the fact that he misunderstood my analysis to show test scores that “stay steady at 1312, compared with 1314 under the status quo.”¹²⁵ But his comparison is incorrect. The correct baseline for a comparison, as stated in the opening report, is not 1314 but 1351 (Hoxby Opening Report, Exhibit 13 Table 3). This is because the Allen-based plan is set up to accept the students with the highest test scores (and GPA) and therefore stacks the deck in favor of finding high test scores.¹²⁶ In my opening report, I therefore showed first what occurs under a pure test score and GPA plan to establish a proper status quo baseline: an average test score of 1351. I *then* computed what occurs when the Census tracts are added: a decrease in average scores from 1351 to 1312.¹²⁷ Therefore, this plan, in addition to having several problems with implementation, results in substantially lower average test scores.¹²⁸ Mr. Kahlenberg’s characterization of the evidence on the geography-based plan in my opening report is, thus, incorrect.

C. The Available Evidence Indicates that None of Mr. Kahlenberg’s Other Hypothesized Race-Blind Strategies Would Provide a Workable Race-Blind Alternative Admissions Plan

84. Mr. Kahlenberg hypothesized that UNC could potentially achieve race-blind admissions through several additional avenues, but does not provide evidence to support his claims or any subsequent analysis of the impact of these avenues. In particular, he argued for the benefits of increasing community college transfers,¹²⁹ increasing financial aid,¹³⁰ ending early admissions,¹³¹

¹²⁴ In excess of 1,539,640 in North Carolina. Hoxby Opening Report, ¶ 243.

¹²⁵ Kahlenberg Rebuttal Report, p. 50–51.

¹²⁶ Hoxby Opening Report, ¶ 247.

¹²⁷ See Hoxby Opening Report, ¶ 243. “Allen’s proposal suggests that universities admit students using two criteria: test scores and grade point averages. This makes comparisons difficult because UNC does not actually admit students now using only these two criteria. In practice, a substantial part of the difference between the Allen plan predictions and UNC’s actual data come from the Allen plan’s reliance on just two factors while UNC weighs many more factors. . . . Therefore, before examining the predictions from an Allen-type plan, it is necessary first to examine whom UNC would admit if its admissions staff admitted students strictly on the basis of their test scores and grade point averages, with no regard to geography. This gives us an informative baseline.”

¹²⁸ Hoxby Opening Report, Section VII.

¹²⁹ Kahlenberg Rebuttal Report, p. 34.

¹³⁰ Kahlenberg Rebuttal Report, p. 21.

¹³¹ Kahlenberg Rebuttal Report, p. 35.

ending alumni preferences,¹³² and increasing recruitment.¹³³ I analyze each alternative and conclude that none would provide a workable race-blind alternative.

1. Increasing Community College Transfers Would Not Be a Successful Race-Blind Alternative

85. Mr. Kahlenberg claims that UNC could increase diversity through increasing transfers from community colleges.¹³⁴ If UNC were to increase its number of transfers from two-year community or technical colleges (hereafter, “community colleges”) substantially, however, the level of academic preparedness of its admitted class would drop substantially. This result would occur because, although community college transfer students are more academically prepared than the general pool of community college students, their average test scores are substantially lower than students who apply straight from high school in the traditional admission process. If UNC were to increase the number of transfer students it accepts, its new pool of transfers would likely be even less qualified than those who currently transfer to UNC. Thus, by enrolling more students via the transfer process and fewer students via the traditional admissions process, UNC is likely to reduce academic preparedness of its student body. There remains a reasonable question, however, about whether increasing the number of transfer students would sufficiently enhance the University’s racial/ethnic diversity to offset the likely sacrifice of academic standards.

86. To address this question, I conduct two types of analysis: (i) one based on UNC increasing its seats for transfer students from community colleges and (ii) one based on UNC admitting students out of high school with the highest test scores and grades who indicate that they plan to attend a community college after high school.

87. The first analysis examines the characteristics of students who would likely be best eligible for transfer to UNC in the event of an expansion of its transfer seats. This group is those students who currently transfer to North Carolina State University (NCSU). Since NCSU is the second-most selective public research university in the state,¹³⁵ its transfer students tend to be the

¹³² Kahlenberg Rebuttal Report, p. 27.

¹³³ Kahlenberg Rebuttal Report, p. 29.

¹³⁴ Kahlenberg Rebuttal Report, p. 34.

¹³⁵ According to US News & World Report, NCSU is ranked second, after UNC, among public universities in North Carolina. “2018 Best Colleges,” *US News and World Report*, <https://www.usnews.com/best-colleges/nc?school-type=national-universities&ranking=top-public>, accessed June 4, 2018. For Fall 2017, UNC reported an admissions rate of 24% with a middle

second-most attractive admissions candidates (based on a holistic review) who have fulfilled the conditions that the state sets for students who wish to transfer from a community college to a four-year campus. That is, although NCSU does not set admissions standards for its transfers that are as high as those that UNC sets, it does use a holistic admissions process and typically sets the second-highest admissions standards within public universities in North Carolina.¹³⁶ Thus, its current transfer students would likely impose the *minimum possible* sacrifice on UNC with respect to its goal of maintaining its status as a highly selective academic institution.¹³⁷

88. Using data from NCSU's website, I estimate that 15.7 percent of North Carolina community college transfer students to NCSU in 2017 were URM.¹³⁸ If I alternatively use data from the U.S. Department of Education, I estimate that 13.2 percent of North Carolina community college transfer students to NCSU in Fall 2016 were URM.¹³⁹ This percentage is an estimate rather than exact figure because it is not possible to be exact in identifying those transfer students who come from, say, community colleges outside the state of North Carolina.¹⁴⁰

89. Regardless of whether one uses 15.7 percent or 13.2 percent as the URM percentage, transfers to NCSU are *less* likely to be URMs than are the members of UNC's current class. For instance, 18 percent of UNC's entering class of 2017 were URMs.¹⁴¹ Thus, if UNC were to substitute transfer students for its typical admits from the normal admissions process, the University would not only likely reduce the academic qualifications of its student body, it would

50% SAT range of 1310-1470 and NCSU reported an admissions rate of 50% with a middle 50% SAT range of 1240-1370. "Class Profile," *The University of North Carolina at Chapel Hill*, <https://admissions.unc.edu/apply/class-profile-2/>, accessed June 4, 2018. See also, "First Year Facts 2017," *North Carolina State University*, https://admissions.ncsu.edu/wp-content/uploads/sites/8/2017/09/FirstYearProfileFacts_FINAL_web.pdf, accessed June 4, 2018.

¹³⁶ "Transfer Application Review," *North Carolina State University*, <https://admissions.ncsu.edu/apply/transfers/application-review/>, accessed June 7, 2018.

¹³⁷ Note that North Carolina already has a well-defined articulation process—that is, a set of conditions that a student must fulfil to be eligible for transfer. The students who satisfy these conditions are, in practice, an unusually academically prepared and motivated subset among community college attendees. Even within this subset, the current transfers to NCSU are "positively selected," though not as positively selected as the current transfers to UNC.

¹³⁸ This is using Mr. Kahlenberg's definition of URM—i.e. black or Hispanic.

¹³⁹ This is using Mr. Kahlenberg's definition of URM—i.e. black or Hispanic.

¹⁴⁰ The U.S. Department of Education reports the racial breakdown of all transfer students enrolling at NCSU in Fall 2016. The categories in this racial breakdown are: white, American Indian or Alaska Native, Black or African American, Native Hawaiian or Other Pacific Islander, Hispanic, Asian, two or more races, nonresident alien, and race/ethnicity unknown. I exclude the counts of nonresident aliens. Percentages are calculated among remaining transfer students, and the percentages for Black or African American and Hispanic sum to 13.2 percent. See "Use the Data," *National Center for Education Statistics*, <https://nces.ed.gov/ipeds/use-the-data>, accessed June 6, 2018. NCSU reports on its website the racial breakdown of transfer students to its campus in Fall 2017, in the categories: white, American Indian or Pacific Islander, Black or African American, Hispanic, Asian, multiracial, international, and unreported. As with the U.S. Department of Education data, I adjusted these percentages to remove international students. The percentages for African American and Hispanic sum to 15.7 percent. See "Transfer Facts 2017," *North Carolina State University*, <https://data.emas.ncsu.edu/project/transfer-profile/>, accessed June 6, 2018.

¹⁴¹ "Class Profile," *The University of North Carolina at Chapel Hill*, <https://admissions.unc.edu/apply/class-profile-2/>, accessed June 4, 2018. This is using Mr. Kahlenberg's definition of URM—i.e. black or Hispanic.

also *reduce* the racial diversity of its student body. There is no tradeoff, in other words: UNC would simply have decreased its attainment of its goals on both relevant dimensions.

90. This lack of a tradeoff (i.e., UNC getting worse on both its academic and racial diversity goals) is despite the assumption that the University would be able to rely exclusively on the most qualified group of students who currently transfer to a four-year campus. Thus, UNC might easily see a much greater decrease in its racial diversity (as well as a reduction in academic achievement) if it were to substitute transfers for students admitted through the normal process.

91. I have pointed out that current transfers to NCSU are more prepared and motivated for four-year education than the typical community college student. They have had to prove themselves at community college to become eligible for transfer. However, Mr. Kahlenberg (who does not give details of his community college proposal) may instead be envisioning a program in which UNC finds the best qualified students who plan to enroll in community college and admits them into UNC directly. That is, Mr. Kahlenberg may be basing his community college ideas on the notion that there are numerous highly qualified students who start out at community colleges but who would actually be a good fit for UNC on academic grounds and would enhance its racial diversity.

92. I test this notion by analyzing what would occur if UNC were to set aside seats for the highest-scoring students who, when they are graduating from high school, state that they will be enrolling in a community college. I conduct this analysis in a manner exactly analogous to the analysis of SES-based plans in my opening report.¹⁴² That is, I:

- i. Set aside a certain number of seats for community college students;
- ii. Assume that UNC could somehow identify all of the community college students who are most qualified for admission (thereby maximizing the alternative, community college plan's chances for success);
- iii. Assume that UNC admits them purely on the basis of their predicted admissions probability (this also greatly favors the alternative, community college plan because the prediction necessarily over-weights test scores and grades); and

¹⁴² Hoxby Opening Report, ¶¶ 160–223.

- iv. Complete the class using UNC's actual holistic admissions process (assuming that current applicants are not less likely to apply even though there are fewer seats for them—yet again choosing the assumption that most favors the alternative plan).

93. As in my opening report, there are substantial advantages to carrying out the analysis in this way. First, the assumptions always attempt to maximize the chances of success for the alternative plan (the community college plan). Note that this analysis maximizes the alternative plan's chances for success in three separate ways: (i) assuming that UNC can identify all the most admissions-worthy community college students, (ii) assuming that UNC admits them on the basis of an admissions index that necessarily over-weights test scores and grades (so that the evaluation of the plan is based on the same criteria that get over-weighted), (iii) assuming that well-qualified students are not deterred from applying to UNC even though their chance of admission has fallen.

94. The second advantage in carrying out the analysis in this manner is that it allows for a varied degree of emphasis on community college students to allow for a range of possible plans. The analysis does this by varying the number of seats from 750 to 1,500—even though no one is suggesting that UNC staff would, or in any way does, literally reserve seats for any particular group of applicants. The seat range is just to show the range of results that could occur depending on how UNC wanted to emphasize the program.

95. The third and perhaps most important advantage to carrying out the analysis as I do is that I can use UNC's actual holistic admissions process to complete the class.¹⁴³ Thus, this analysis directly addresses the question of whether UNC could, by combining a community college-based plan with holistic review, find a workable race-neutral alternative.¹⁴⁴

96. In each case, UNC cannot attain its current level of academic preparation and racial diversity by admitting the highest-scoring community college students. This is mainly because even the highest scoring community college students are *much* less academically prepared than UNC's admits. The full results for each case are in Appendix A, but **Exhibit 6** provides two examples on either end of the spectrum of emphasis. Exhibit 6 Table 1 shows the admitted

¹⁴³ Hoxby Opening Report, ¶ 185.

¹⁴⁴ As in my opening report, there are two steps in this analysis of an alternative plan: a “disadvantaged step” and a “completing-the-class” step. I order the community college pool of students (the students who are marked in the NCERDC data as planning to attend an in-state community college) according to their rank based on a race-blind UNC admissions index. To generate this index, I use the same model of UNC's current admissions process that I used in my opening report. I “admit” the students with the highest admissions index up to a number of seats (750, 1000, 1250 or 1500). This completes the disadvantaged step. I then “complete the class” just as I did in my opening report. Hoxby Opening Report, ¶¶ 160–223.

students in the case in which 750 seats are set aside; in that case the average combined SAT score among community college admits would be 1141. Exhibit 6 Table 2 shows the admitted students in the case in which 1500 seats are set aside; in that case the average combined score among community college admits would be 1067. These scores are much lower than the average score of 1330 among current UNC admits from North Carolina public schools.

97. In short, the notion that racial diversity would be increased through numerous highly qualified students who start out at community colleges is not supported by the data regarding North Carolina's actual community college students. Thus, regardless of how favorably community college students are selected—either by focusing on NCSU transfers or by focusing on the highest scoring entrants at community colleges—the evidence strongly contradicts Mr. Kahlenberg's claim that UNC could attain its current levels of academic preparedness and racial diversity using a community college plan.

2. Mr. Kahlenberg's Suggestion that UNC Partner with Disadvantaged Schools Would Not Eliminate the Need to Consider Race

98. I also analyze a race-blind plan that attempts to operationalize Mr. Kahlenberg's suggestion that UNC could partner with disadvantaged high schools (which I call an economically disadvantaged school plan). It should be noted that this plan has already been examined, to a great extent, in my opening report.¹⁴⁵ This is because high school characteristics—such as the percentage of students who are economically disadvantaged (on free lunch or reduced-price lunch) were *already* incorporated in all of the SES indices that I constructed and tested in my opening report. If measures of a high school's characteristics, including disadvantage, were actually helpful in generating alternative plans that worked (i.e. in generating proxies for race and ethnicity that were very useful), I would have expected to discover this result in my opening report. Nevertheless, since Mr. Kahlenberg suggested UNC could use a plan focusing on disadvantaged high schools to achieve a workable race-blind alternative, I assess that plan here.

99. My analysis is similar to the analyses I conducted of SES-based plans in my opening report, but, in this plan, students are given preference if they attend a high school that is among the most disadvantaged (rather than a broader definition of SES-disadvantage based on multiple

¹⁴⁵ Hoxby Opening Report, ¶¶ 160–223.

indicators). Specifically, I consider a high school more disadvantaged if it has a higher percentage of students eligible for free or reduced-price lunch.¹⁴⁶

100. As in my opening report, I assess 16 cases for the economically disadvantaged school plan to evaluate the range of reasonable alternatives that could result through:¹⁴⁷

- i. 4 different level of emphasis, based on the purely hypothetical assumption that admissions staff aim to admit 750, 1,000, 1,250, or 1,500 students from disadvantaged schools. As before, I do not suggest that UNC would actually set aside seats but this approach allows me to predict the results depending on the range of different levels of emphasis that the admissions staff might place on a student's high school disadvantage status.
- ii. 4 different thresholds for being considered a disadvantaged school: the top 10, 15, 20, and 25 percent of schools with the highest concentration of free and reduced-price lunch students. (The school with the highest concentration of such students gets the highest rank.) This allows me to consider a range of high schools as potentially "disadvantaged."

101. For each of the cases, I apply the threshold and employ the UNC admission index (the same index used for my community college analysis above) to admit the students in the disadvantaged step. I then complete the class as I did in my opening report, using UNC's actual holistic admissions process to the extent possible. Thus, I consider whether UNC could combine an economically-disadvantaged-school plan with holistic admissions to attain a class that maintains its current levels of racial diversity and academic preparedness.

102. I provide the full results for each of these cases in Appendix B. I show that, for all 16 cases, the economically-disadvantaged-school plan would result in a class with substantially lower levels of academic preparedness than UNC's actual admitted class and actual matriculating class. This is largely because schools with the greatest concentrations of economically disadvantaged students contain few students who are well-prepared for UNC based on average test scores. This is consistent with the finding in my opening report that many of North

¹⁴⁶ Mr. Kahlenberg used this measure to define his "SES school" bump. In his Simulation 4 in his opening report, he gives this bump to students in the one-third of North Carolina high schools with the highest proportion of students eligible for free or reduced-price lunch. Kahlenberg Opening Report, fn. 269.

¹⁴⁷ Hoxby Opening Report, ¶ 169.

Carolina's best prepared URM and SES-disadvantaged students attend high schools that are not dramatically segregated from a racial and/or economic perspective.¹⁴⁸

103. **Exhibit 7** shows the results for two cases at either end of the spectrum of emphasis and threshold. In Exhibit 7 Table 1 (emphasis of 750 seats, threshold of 10 percent most disadvantaged schools), the average test score of a student admitted in the disadvantaged step (i.e. from a disadvantaged high school) is only 894. In Exhibit 7 Table 2, which illustrates the other end of the spectrum (emphasis of 1,500 seats, 25 percent most disadvantaged schools), the average test score of student admitted in the disadvantaged step is only 1116. These test scores—894 and 1116—are well below the average test score of 1330 among of UNC's current admits from North Carolina public schools. Because the economically-disadvantaged-school plan always ends up admitting students who score far below UNC's actual students, it always sets up UNC for an impossible challenge when it tries to complete the class. Despite my best attempts to implement Mr. Kahlenberg's proposal, UNC would not be able to attain its current levels of both racial diversity and academic preparedness based on average SAT.

104. It is worth emphasizing why this failure to attain racial diversity and academic preparedness occurs so consistently. The economically-disadvantaged-school plan forces UNC to skip over many of the most qualified URM and disadvantaged students in the state—substituting for them *less well-qualified* URM and disadvantaged students. I showed this same finding in multiple different ways under numerous different plans in my opening report.¹⁴⁹ Under UNC's current admissions program, such well-qualified students are not skipped or ignored. Therefore, relative to its current admissions plan, UNC is always "starting from behind" when it uses an economically-disadvantaged-school plan. It does not matter which emphasis or threshold (case) I use. Simply put, there is not such an oversupply of well-qualified URM and disadvantaged students in North Carolina that UNC can afford to skip over or ignore many of them and yet expect its admissions process to achieve the same levels of racial diversity and academic preparedness.

¹⁴⁸ Hoxby Opening Report, ¶¶ 232–233.

¹⁴⁹ Hoxby Opening Report, Sections V, VI, and VII.

3. Mr. Kahlenberg's Suggestion that UNC Would No Longer Need to Consider Race if it Increased Levels of Financial Aid Is Unrealistic and Ignores UNC's Current Generous Financial Aid Policies

105. Mr. Kahlenberg suggested that UNC could combine increased financial aid with a race-blind admissions process to achieve its goals on academic preparedness and racial diversity.¹⁵⁰

Mr. Kahlenberg provides no specific steps or proposal of how such an increase might be implemented, and his suggestion ignores current UNC policy and financial aid laws.

106. UNC already has financial aid and tuition policies that have made it the *highest ranked* public university on value-for-money among all the institutions considered by Kiplinger. It has been highest ranked on value-for-money in every year that Kiplinger has done rankings.¹⁵¹

107. In addition, UNC's Carolina Covenant program—which provides support to low-income students at UNC—is arguably already the most generous financial aid program for low-income students among flagship public universities.¹⁵² The Carolina Covenant program covers the entire cost of attendance—*without loans*—for students whose families have incomes under 200 percent of the federal poverty line.¹⁵³ The 2018 federal poverty line for a family of four is \$25,100 so 200 percent of the federal poverty line is \$50,200.¹⁵⁴ To put this in context, about one-third of all North Carolina families have incomes below 200 percent of the federal poverty line.¹⁵⁵ That is, if a student were from a family in about the bottom third of North Carolina families (judged relative to the poverty rate), then he or she could attend UNC for free: no tuition, no room or board. Among other state flagship university programs, the Carolina Covenant stands out as unusually generous. The only program that competes with it for generosity is that of the University of Virginia, which has similar parameters.¹⁵⁶ However, owing to differences between

¹⁵⁰ Kahlenberg Rebuttal Report, pp. 21–22.

¹⁵¹ “Need-based aid awards averaging more than \$17,000 a year make this public research university a bargain for in-state students who qualify—cutting the school's in-state cost to \$4,905 a year.” “Kiplinger's Best College Values, 2018,” *Kiplinger*, <https://www.kiplinger.com/article/college/T014-C000-S002-kiplinger-s-best-college-values-2018.html>, accessed June 4, 2018.

¹⁵² Pallais, Amanda, and Sarah E. Turner, “Access to Elites,” in *Economic Inequality and Higher Education*, edited by Stacy Dickert-Conlin and Ross Rubenstein, Russell Sage Foundation, 2007.

¹⁵³ “About the Covenant,” *The University of North Carolina at Chapel Hill*, <https://carolinacovenant.unc.edu/about-the-covenant/>, accessed June 6, 2018.

¹⁵⁴ “U.S. Federal Poverty Guidelines Used to Determine Financial Eligibility for Certain Federal Programs,” *U.S. Department of Health & Human Services*, <https://aspe.hhs.gov/poverty-guidelines>, accessed June 4, 2018.

¹⁵⁵ “Distribution of the Total Population by Federal Poverty Level (above and below 200% FPL),” *Kaiser Family Foundation*, 2017, <https://www.kff.org/other/state-indicator/population-up-to-200-fpl/>, accessed June 4, 2018.

¹⁵⁶ “Financial Aid,” *University of Virginia*, <http://financialaid.virginia.edu/>, accessed June 6, 2018.

the two states' income distributions, a lower share of families in Virginia have incomes under 200 percent of the federal poverty line.¹⁵⁷

108. Moreover, universities generally cannot give students financial aid in excess of their cost of attendance. Since the Carolina Covenant already covers eligible students' entire cost of attendance *without loans*, UNC could not realistically increase its grants to students whose families have incomes below 200 percent of the federal poverty line by more than a small amount.¹⁵⁸ In both his opening and rebuttal reports, Mr. Kahlenberg defined students as being low-income or economically disadvantaged (and hence eligible for his "SES Family" bump) when they have family incomes of less than 185 percent of the federal poverty line, not *more* than 185 percent of the federal poverty line.¹⁵⁹ Thus, Mr. Kahlenberg's proposal to increase financial aid for low-income students appears not to take into account UNC's existing Carolina Covenant program or the rules that govern financial aid.

109. Finally, if UNC were to increase financial aid for middle-income students (families with incomes in North Carolina's 34th through 67th percentiles), UNC might indeed attract more applicants from this group. However, students in this group who are reasonably qualified for UNC are mainly white and Asian,¹⁶⁰ so providing them additional aid would not improve UNC's racial diversity as Mr. Kahlenberg claims.

¹⁵⁷ "Distribution of the Total Population by Federal Poverty Level (above and below 200% FPL)," *Kaiser Family Foundation*, 2017, <https://www.kff.org/other/state-indicator/population-up-to-200-fpl/>, accessed June 4, 2018.

¹⁵⁸ Taxes are owed on grants in excess of tuition and fees. Grants in excess of the cost of attendance are, in all cases, taxable earnings. The text refers to "a small amount" which is the amount by which grants would increase if students' work-study earnings were to be replaced by grants. According to UNC's Net Price Calculator, UNC's cost of attendance is \$23,734 and a low-income Carolina Covenant student's financial aid package would have a maximum of \$3,000 in work-study. "Net Price Calculator," *The University of North Carolina at Chapel Hill*, <https://npc.collegeboard.org/student/app/unc>, accessed June 7, 2018. Some Carolina Covenant students already have less than \$3,000 in work-study because they qualify for specific grants in addition to the basic financial aid package. The research is divided on whether reducing work-study to zero would even be attractive to low-income students or help them to persist in school. The reason is that work-study jobs allow students to connect with on-campus adults (library and laboratory staff, for instance) and acquire employment experience. For a review of the evidence, which generally suggests positive effects of work-study, see Scott-Clayton, Judith, "Federal Work-Study: Past Its Prime, or Ripe for Renewal?" *Economic Studies at Brookings: Evidence Speaks Reports*, Vol. 2, No. 16. (2017): 1–5. Note that the Net Price Calculator, currently available online at <https://npc.collegeboard.org/student/app/unc>, is kept up to date by UNC so that the above numbers could change by the time that this paragraph is read.

¹⁵⁹ Mr. Kahlenberg gives students who are eligible for free or reduced-price lunch the "SES family" bump in his simulations. Students with family incomes below 185 percent of the federal poverty line are eligible for free or reduced-price lunch. See Hoxby Opening Report, ¶ 143.

¹⁶⁰ In 2015, the percentage of qualified middle-income students who were white or Asian was 86%, where qualified students have SAT combined scores of 1220 or higher. See Hoxby Opening Report, Exhibit 5 Table 1.

4. Ending Early Admissions Preferences Would Not Create a Workable Race-Blind Alternative

110. Mr. Kahlenberg has provided no evidence that UNC's early action program favors non-URMs. As discussed in my opening report,¹⁶¹ UNC has an early action program (which allows a student to apply to UNC early but does not require the student to commit to attend if accepted), *not* an early decision program (which binds the student to attending if accepted). Yet, Mr. Kahlenberg appears to continue to conflate early action with early decision in his discussion of the impacts of those programs.

111. Although early action and early decision programs both have the word "early" in their titles, they are polar opposites for low-income students. Early action benefits low-income students by giving them the *option* of admission and a known financial aid package that can only make them better off in considering (and negotiating for) their full choice set of college admissions offers.

112. Because early decision and early action programs are polar opposites for low-income student, it is misleading to conflate them. Mr. Kahlenberg's claims that UNC's early action program puts low-income students at a disadvantage is not only misleading but also wrong; it contradicts research and logic that indicate that early action programs give an advantage to *lower-income* students rather than affluent students.¹⁶²

5. Eliminating Preferences for the Children of UNC Alumni Has Almost No Impact on UNC Admissions Decisions

113. Mr. Kahlenberg suggested that eliminating "legacy preferences" would allow UNC to improve on its goals of academic preparedness and racial diversity.¹⁶³ That is, he suggested that eliminating "legacy preferences" (or alumni preferences) would make enough of a difference that it would allow UNC to practice race-blind admissions and attain its goals. In my rebuttal report I

¹⁶¹ Hoxby Opening Report, ¶ 27. "Students who are admitted under the non-binding Early Action program do not need to make their matriculation decisions before the spring deadline—they face the same deadline faced by students admitted in the Regular Decision process. I note that the Complaint appears to wrongly conflate UNC's Early Action program with a binding early decision program, which UNC does not have. Students who are admitted under the non-binding Early Action program have ample opportunity to assess their financial aid offers before making their matriculation decision."

¹⁶² Avery, Christopher, and Jonathan Levin, "Early Admissions at Selective Colleges." *American Economic Review*, Vol. 100, No. 5. (2010): 2125-2156.

¹⁶³ The phrase "legacy preferences" is Mr. Kahlenberg's. Empirically, there appears to be no formulaic or otherwise standard increase in admissions probability associated with being the child of a UNC alumnus.

showed that eliminating all effects associated with being an alumnus's child hardly affects the class that UNC admits. As an empirical matter, being the child of an alumnus has an effect on admission that is too small to be relevant to the question at hand—whether UNC could achieve its goals using race-blind admissions.¹⁶⁴ That is, eliminating any effect on admissions probability association with being an alumnus's child would not be a standalone workable race-blind alternative.¹⁶⁵

114. However, it is theoretically possible that eliminating “legacy preferences” would be enough, when combined with other race-blind admissions schemes, to achieve UNC’s goals on academics, racial diversity, and other dimensions. This is Mr. Kahlenberg’s claim.¹⁶⁶ He is proven wrong, however, by his own simulations. In his simulations, Mr. Kahlenberg *did* eliminate “legacy preferences” in combination with giving bumps for SES disadvantage. These same simulations were not able to achieve the combination of academic preparedness and racial diversity that UNC currently achieves with its class. Thus, Mr. Kahlenberg’s own simulations demonstrate that his suggestion would not work.

D. I Disagree with Mr. Kahlenberg’s Identification of Alleged Errors in My Opening Report

115. Mr. Kahlenberg made a number of interpretative errors and mischaracterizations of my views in discussing the results of my opening report. For example, Mr. Kahlenberg claims that I made a “conceptual error” by focusing on SAT scores as a measure of academic preparedness in my analysis of race-blind alternative plans. He claims that this focus is “contrary to the stated values of UNC.”¹⁶⁷ But I explicitly stated in my opening report that UNC values many factors other than SAT scores in its admissions. I explained that my focus on SAT scores in evaluating race-blind plans was driven by necessity because, owing to UNC’s non-formulaic, holistic admissions and broad goals for its admissions process, it is not possible to calculate a measure of “fit” for UNC for prospective applicants under a hypothetical alternative admissions plan.¹⁶⁸

¹⁶⁴ To be clear, what I mean by “small” is that there is only a small effect of being the child of an alumnus, holding everything else constant. It is not, in fact, automatic that everything else is held constant: applicants who are the children of alumni are, on average, better qualified on observable grounds than applicants who are not children of alumni.

¹⁶⁵ Hoxby Rebuttal Report, ¶ 172.

¹⁶⁶ Kahlenberg Rebuttal Report, p. 28.

¹⁶⁷ Kahlenberg Rebuttal Report, p. 16.

¹⁶⁸ Hoxby Opening Report, ¶ 106. “In an ideal world, I would compute the effect of each alternative admissions plan on “fit,” the holistic determination based on all of the criteria used by the university to assess whether an applicant should be admitted. However, measures of holistic “fit” could not possibly be available for students who did not actually apply to UNC because, as previously shown, the process by which readers assess a student is far from formulaic...” See also ¶16 “UNC also aims to admit

Indeed, there is a considerable section in my opening report devoted to the issue of how one can evaluate alternative admissions plans—using measures such as SAT scores but not only SAT scores—given UNC’s actual holistic admissions process.¹⁶⁹

116. In addition to criticizing my focus on SAT scores as a measure of academic preparedness, Mr. Kahlenberg suggests that I should evaluate all race-blind alternatives using admitted students’ high school GPAs.¹⁷⁰ I disagree. While UNC considers and values the high school GPAs of the students it admits, it does so in the context of holistic admissions. That is, it considers high school GPA as one of many factors in a process in which it is able to put GPA in context. Putting GPA in context is crucial because one high school’s “A” is another high school’s “B” or “C”. In other words, UNC can account for differences across high schools in what constitutes a high or low GPA. In contrast, my analysis of race-blind plans must evaluate students from all high schools *on criteria that are the same across all high schools*. It would be a serious error to evaluate race-blind plans using GPAs without putting those GPAs in context.

E. Mr. Kahlenberg Incorrectly Applies the Findings from My Research on Recruiting

117. Plaintiff and its expert, Mr. Kahlenberg, have at various places tried to frame my research on “the missing one-offs” and Expanding College Opportunities, as supportive of the notion that enhanced recruiting of low-income, high-achieving students could substitute for race-conscious admissions.¹⁷¹ In my opening report, I specifically noted that this notion is wrong: my research does *not* support the notion that recruiting of low-income, high-achieving students is a substitute for race-conscious admissions.¹⁷² Rather, expanding access to selective colleges for low-income high-achieving is *an end in itself* because such students have earned these educational opportunities and (I show) make extremely good use of them and, thus, society’s investment is more than repaid. My research does not say anything about whether these students could somehow be used as a “substitute” for race-conscious admissions.

students whose academic preparedness and performance will contribute to the University’s ‘commitment to excellence as one of the world’s great research universities.’ As such, UNC evaluates applicants on, among other things, academic performance, academic program, and standardized testing. These are just some of the many criteria of ‘fit’ that UNC has considered relevant... In my report I use the term ‘fit’ to refer to how well an applicant to UNC ‘fits’ the criteria that UNC has defined as relevant to its mission.”

¹⁶⁹ Hoxby Opening Report, ¶¶117–122.

¹⁷⁰ Kahlenberg Rebuttal Report, p. 16.

¹⁷¹ Kahlenberg Rebuttal Report, pp. 30–31.

¹⁷² Hoxby Opening Report, ¶¶279–286.

118. What my research says (very briefly) is that high-achieving, low-income students who are “one-offs” (in the sense that they are one of only a few high-achieving students in their schools) are significantly more likely to apply to a selective university if they are given information about the admissions process, the “net price” (tuition net of financial aid), and the resources and outcomes of selective universities. For example, consider a low-income, high-achieving student who is the only person in his high school class (or perhaps several classes from his high school) whose academic preparation is a great fit for UNC or another very selective university. Because he is isolated, he might not realize that he is eligible for application fee waivers. He might not realize that he would not pay the tuition that UNC charges affluent students but would instead pay no tuition under UNC’s Carolina Covenant program. He might not realize that UNC’s typical student has achievement very similar to his own. He might not realize that UNC’s faculty, libraries, labs, programs, and many other resources are exceptional. He might not realize that UNC’s graduation rate is much higher than that of some other schools. However, if this same student is informed about all these things, he is much more likely to apply to UNC (and other very selective colleges), to be admitted, to matriculate, and to graduate successfully and on-time. Put simply, we can change the lives of low-income, high-achieving students by giving them the information that they need to make college-going decisions for themselves.

119. In my opening report, I made it plain that my research is about the findings mentioned in the previous paragraph. My research shows that these effects exist for “one-offs”—low-income students who are among the few high-achievers in their high school class.¹⁷³ However, my research also shows that these effects do *not* exist for low-income high-achievers who attend a high school where numerous other students are high achievers too. (For instance, these effects would not exist for a low-income high achiever who attended the North Carolina School of Science and Mathematics, a selective magnet high school, or another private or public school that contained a critical mass of high achievers.)

120. In my opening report, I point out that the “one-offs” are *less* likely to be URMs than are members of UNC’s current class.¹⁷⁴ More generally, one-offs are just not related to race and ethnicity in a systematic way. As a result, enhanced recruiting of the “one-offs” could not

¹⁷³ Hoxby Opening Report, ¶¶ 280–281.

¹⁷⁴ Hoxby Opening Report, ¶¶ 12, 285–286.

substitute for race-conscious admissions. In fact, if one were to substitute a one-off for a student that UNC currently admits, the percentage of URMs in UNC's admitted class would fall.¹⁷⁵

121. Mr. Kahlenberg goes so far as to cite an email which I wrote (which he takes out of context) as supporting the notion that recruitment of high-achieving low-income students could effectively substitute for race-conscious admissions.¹⁷⁶ In fact, as I stated in the email, this issue and my research are "orthogonal." As an economist, what I meant by "orthogonal" is that my research does *not* say anything about whether "one-offs" are substitutes for race-conscious admissions ("X is orthogonal to Y" means that knowing about X provides no information whatsoever about Y).¹⁷⁷

122. Thus, when I said that my research was orthogonal to race-conscious versus race-blind admissions, I was stating that high-achieving, low-income one-offs were not relevant to questions of race-conscious versus race-blind admissions. Put another way, I was stating that my research indicated that high-achieving, low-income students would benefit by being more informed *regardless* of whether they were white, black, purple, green, or any other color. Their being informed turns out—in fact—not to be a substitute for race-conscious admissions.

123. In his rebuttal report, Mr. Kahlenberg ignores my research and instead calculates the set of students who are "high achieving" low-income students who do not apply to UNC regardless of whether they are "one-offs." There are multiple problems with his approach, but most importantly, he has not identified the set of students for whom my research demonstrates that application behavior is changed by information about college.¹⁷⁸ Many of the students whom Mr. Kahlenberg uses in his calculations are not "one-offs".¹⁷⁹ Mr. Kahlenberg's students are usually *not* isolated so, therefore, the reason that they do not apply to UNC is likely not that they are poorly informed. Rather, they may be well-informed students who, if they do not apply to UNC, do not do so because they are already applying to (and perhaps being admitted by) other selective

¹⁷⁵ Hoxby Opening Report, ¶ 285.

¹⁷⁶ Kahlenberg Rebuttal Report, p. 34.

¹⁷⁷ See, for example, Rodgers, Joseph, W. Alan Nicewander, and Larry Toothaker, "Linearly Independent, Orthogonal, and Uncorrelated Variables," *The American Statistician*, Vol. 38, No. 2. (1984): 133. "Linearly independent, orthogonal, and uncorrelated are three terms used to indicate lack of relationship between variables."

¹⁷⁸ Hoxby Opening Report, ¶ 281.

¹⁷⁹ Hoxby, Caroline, and Christopher Avery, "The Missing 'One-Offs': The Hidden Supply of High-Achieving, Low Income Students," *Brookings Papers on Economic Activity*, (2013): 3. "...achievement-typical students are highly concentrated. Some of these low-income students attend a small number of 'feeder' high schools that contain a critical mass of high achievers. Some feeder schools admit students on the basis of an exam or previous grades; others are magnet schools; still others contain a subpopulation of low-income students in a student body that is generally affluent."

universities.¹⁸⁰ Mr. Kahlenberg's students are *not* high-achieving by the standards of my research, in which an SAT of 1300 defines high-achieving. Without explanation or discussion of the conflict with my research, Mr. Kahlenberg sets the test score cutoff for "high achieving" to 1080. But, an SAT score of 1080 is not only out of line with my research, it is also out of line with UNC's typical standards. A student with an SAT score of 1080 has only an 18% probability of admission at UNC, even if he or she is an in-state applicant.

124. In summary, Mr. Kahlenberg's claim does not rely upon my research and in fact is not supported by my research. My research does not indicate that informing low-income, high-achieving students is such a good substitute for race-conscious admissions that it could allow a UNC to practice race-blind admission without substantial sacrifices on academic preparation, racial diversity, or other student characteristics that the University seeks in order to attain its goals.

IV. Conclusion

125. In my opening report, I conducted analyses of both UNC admissions data and data on all North Carolina public high school students and found, among other things, that (1) race is not a dominant factor in UNC admissions and (2) there is no workable race-blind alternative that would allow UNC to maintain its racial diversity while also maintaining its current academic standards.

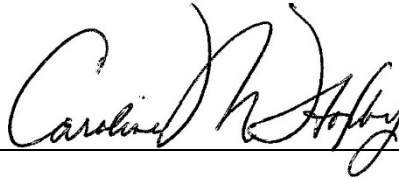
126. In my rebuttal report, I showed how Prof. Arcidiacono's claims relating to UNC's admissions processes, including the role of race in that process, are unreliable and misleading. I showed also that the simulations, performed by Prof. Arcidiacono but contained in Mr. Kahlenberg's report, were unreliable in assessing alternative hypothetical admissions processes, in part, because they were based entirely on past UNC applicants and that Mr. Kahlenberg's proposed socioeconomic preferences were so large as to swamp other factors in a student's application.

127. For the reasons detailed in this report, none of the analysis or opinions presented in the Arcidiacono Rebuttal Report or Kahlenberg Rebuttal Report changes any of the opinions I presented in my opening and rebuttal reports.

¹⁸⁰ Hoxby, Caroline, and Christopher Avery, "The Missing 'One-Offs': The Hidden Supply of High-Achieving, Low Income Students," *Brookings Papers on Economic Activity*, (2013): 26–27.

128. I reserve the right to amend or supplement my report and opinions in light of any additional information produced in the discovery process.

Dated: June 8, 2018

A handwritten signature in black ink, reading "Caroline M. Hoxby", is positioned above a solid horizontal line.

Caroline M. Hoxby

Exhibits

EXHIBIT 1

Arcidiacono Measure of "Share Due to" Various Factors, Using Arcidiacono's Preferred Model [1] 2011-12 to 2016-17 Admissions Cycles [2]

	African American Applicants	Hispanic Applicants	All Applicants
In-State Applicants			
"Share Due to" SAT Preferences	99.6%	99.8%	99.9%
"Share Due to" GPA Preferences	32.8%	30.6%	28.1%
"Share Due to" Percentile Preferences	30.8%	27.2%	23.6%
"Share Due to" Program Rating Preferences	51.3%	50.4%	49.5%
"Share Due to" Essay Rating Preferences	22.5%	20.8%	18.7%
"Share Due to" Personal Quality Rating Preferences	30.4%	28.1%	24.4%
"Share Due to" Activities Rating Preferences	38.5%	36.0%	33.7%
"Share Due to" Performance Rating Preferences	84.6%	85.8%	87.3%
"Share Due to" Race/Ethnicity Preferences	41.7%	23.8%	5.4%
Total	432.1%	402.5%	370.5%
Out-of-State Applicants			
"Share Due to" SAT Preferences	100.0%	100.0%	100.0%
"Share Due to" GPA Preferences	21.1%	25.8%	29.1%
"Share Due to" Percentile Preferences	46.4%	45.6%	49.9%
"Share Due to" Program Rating Preferences	14.9%	25.6%	29.8%
"Share Due to" Essay Rating Preferences	100.0%	100.0%	100.0%
"Share Due to" Personal Quality Rating Preferences	100.0%	100.0%	100.0%
"Share Due to" Activities Rating Preferences	36.5%	42.2%	51.2%
"Share Due to" Performance Rating Preferences	33.4%	48.0%	57.4%
"Share Due to" Race/Ethnicity Preferences	91.1%	70.2%	21.5%
Total	543.4%	557.4%	538.9%

Source: Connect Carolina; Expert Report and Production of Peter S. Arcidiacono, April 6, 2018

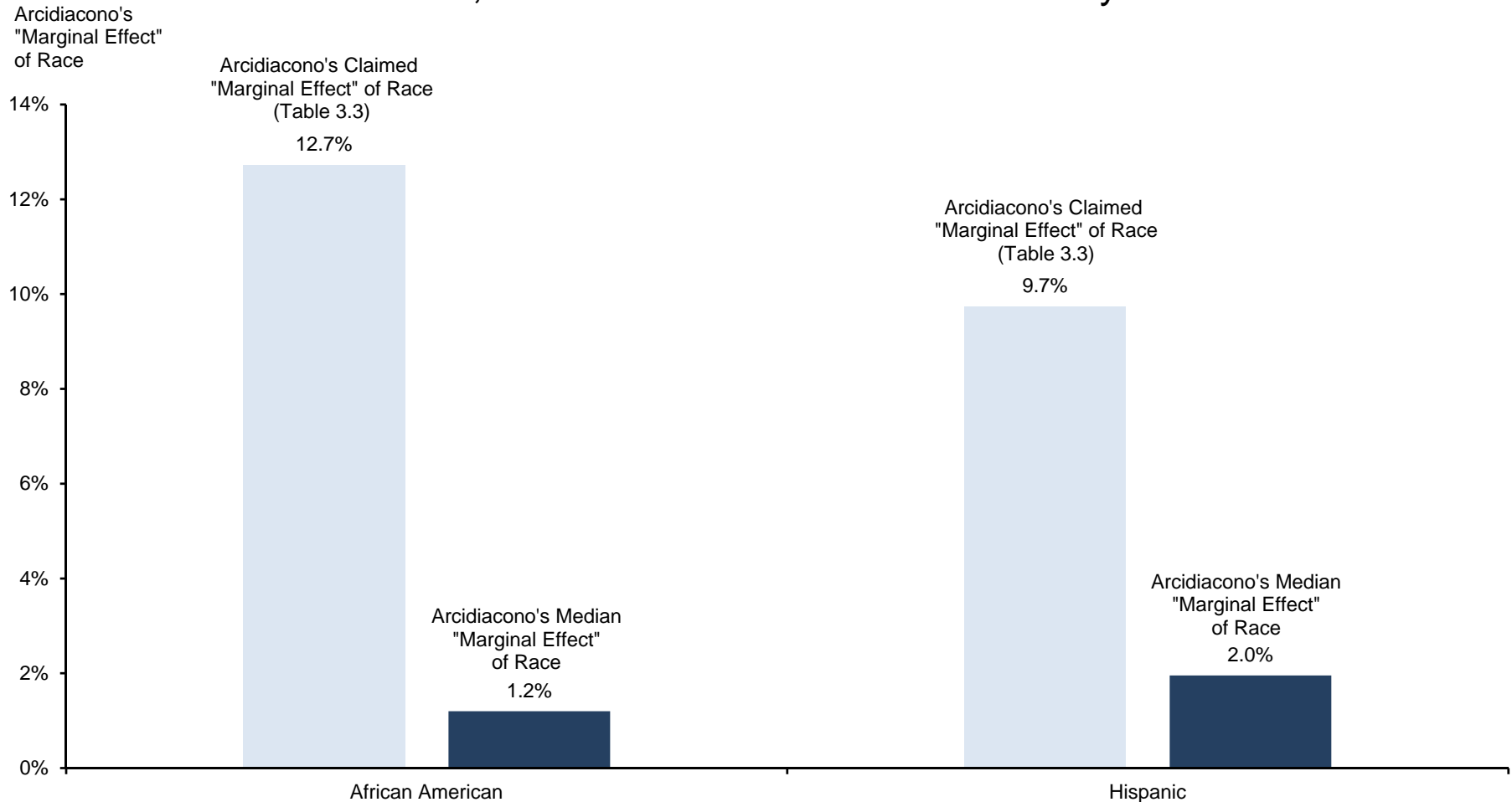
Note:

[1] "Marginal effects" are calculated as the difference between the average admissions probability for all in-state and out-of-state applicants (in the given category) that are included in Arcidiacono's Preferred Model (column 4 of Appendix B Table A.4.1.R for in-state applicants and column 4 of Appendix B Table A.4.2.R for out-of-state applicants), and the same average admissions probability calculated with the indicated variable "turned off" (set to its minimum value) and Arcidiacono's "missing" indicator variables related to that variable "turned off." The "share due to" a given preference is this "marginal effect" divided by the original average admissions probability (which includes the indicated preferences). Note that this Exhibit is based on Arcidiacono's Preferred Model, which does not accurately reflect UNC's admissions process or decisions.

[2] The 2011-12 to 2016-17 admissions cycles refer to the classes of 2016 through 2021 per Arcidiacono's terminology.

EXHIBIT 2 FIGURE 1

Arcidiacono's Claimed "Marginal Effect" of Race, Compared to Arcidiacono's Median "Marginal Effect" of Race In-State, 2011-12 to 2016-17 Admissions Cycles

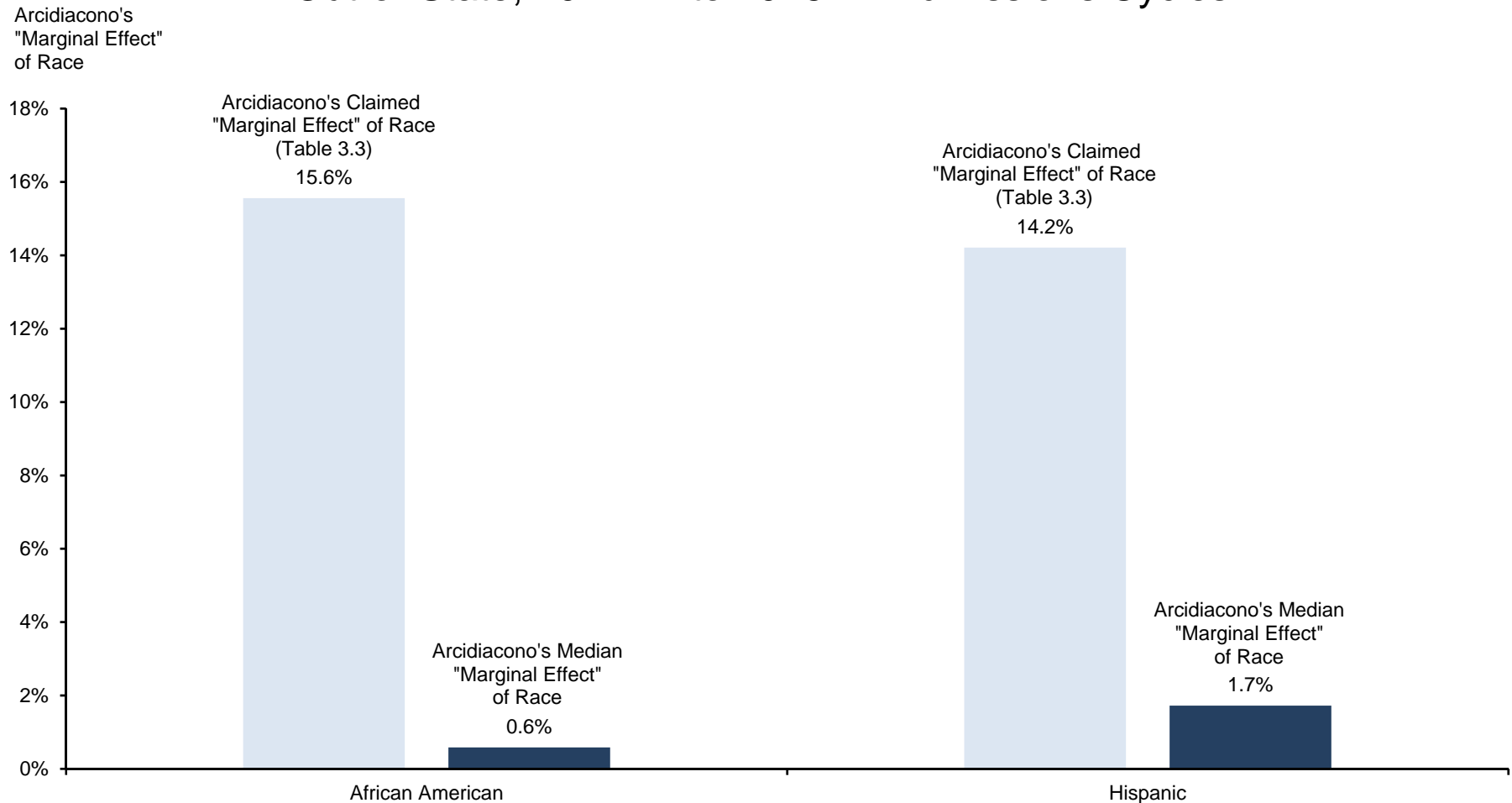


Source: Connect Carolina; Expert Report and Production of Peter S. Arcidiacono, April 6, 2018

Note: The 2011-12 to 2016-17 admissions cycles refer to the classes of 2016 through 2021 per Arcidiacono's terminology. In Table 3.3 of his Rebuttal Report, Prof. Arcidiacono calculates applicants' admissions probabilities with and without "racial preferences" under his model of UNC admissions. He reports the average of the differences between these two probabilities as the "Marginal Effect of Race." This average difference is reported here as "Arcidiacono's Claimed 'Marginal Effect' of Race (Table 3.3)." The median of these same differences is reported here as "Arcidiacono's Median 'Marginal Effect' of Race." Note that this Figure is based on Arcidiacono's Preferred Model, which does not accurately reflect UNC's admissions process or decisions.

EXHIBIT 2 FIGURE 2

Arcidiacono's Claimed "Marginal Effect" of Race, Compared to Arcidiacono's Median "Marginal Effect" of Race Out-of-State, 2011-12 to 2016-17 Admissions Cycles



Source: Connect Carolina; Expert Report and Production of Peter S. Arcidiacono, April 6, 2018

Note: The 2011-12 to 2016-17 admissions cycles refer to the classes of 2016 through 2021 per Arcidiacono's terminology. In Table 3.3 of his Rebuttal Report, Prof. Arcidiacono calculates applicants' admissions probabilities with and without "racial preferences" under his model of UNC admissions. He reports the average of the differences between these two probabilities as the "Marginal Effect of Race." This average difference is reported here as "Arcidiacono's Claimed 'Marginal Effect' of Race (Table 3.3)." The median of these same differences is reported here as "Arcidiacono's Median 'Marginal Effect' of Race." Note that this Figure is based on Arcidiacono's Preferred Model, which does not accurately reflect UNC's admissions process or decisions.

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EXHIBIT 3

"Accuracy" of Arcidiacono Model with and without "Racial Preferences" 2011-12 to 2016-17 Admissions Cycles [1]

	"Accuracy" for Admits	"Accuracy" for Rejects	Overall "Accuracy"
In-State Applicants			
Arcidiacono's Preferred Model with "Racial Preferences" [2]	91.8%	92.5%	92.1%
Arcidiacono's Preferred Model without "Racial Preferences" [3]	90.7%	91.5%	91.1%
Difference in "Accuracy" (with "Racial Preferences" – without "Racial Preferences")	1.1%	1.0%	1.0%
Out-of-State Applicants			
Arcidiacono's Preferred Model with "Racial Preferences" [4]	75.4%	96.1%	93.3%
Arcidiacono's Preferred Model without "Racial Preferences" [3]	68.3%	95.0%	91.4%
Difference in "Accuracy" (with "Racial Preferences" – without "Racial Preferences")	7.1%	1.1%	1.9%

Source: Connect Carolina; Expert Report and Production of Peter S. Arcidiacono, April 6, 2018

Note:

[1] The 2011-12 to 2016-17 admissions cycles refer to the classes of 2016 through 2021 per Arcidiacono's terminology.

[2] This row is from Arcidiacono Rebuttal Report Table 3.1.

[3] Race/ethnicity is excluded from Arcidiacono's Preferred Model. Other than this change to exclude "racial preferences," "accuracy" is computed exactly as in the rows labeled "Preferred Model" in Arcidiacono Rebuttal Report Tables 3.1 and 3.2, as the number of correct predictions divided by the appropriate sample size.

Note that this Exhibit is based on Arcidiacono's Preferred Model, which does not accurately reflect UNC's admissions process or decisions.

[4] This row is from Arcidiacono Rebuttal Report Table 3.2.

EXHIBIT 4 TABLE 1

Analyzing UNC's Admissions Process: Race/Ethnicity as Additive Factors 2011-12 to 2016-17 Admissions Cycles [1]

	(A)	(B)	(C)	(D)	(E) = (B) x (A)	(F) = (C) x (A)
Description of Specification	Pseudo R ²	Share of Pseudo R ² Due to Test Scores	Share of Pseudo R ² Due to Race/Ethnicity	Share of Pseudo R ² Due to Variables Other than Race/Ethnicity and Test Scores	Share of Admissions Decision due to Test Scores	Share of Admissions Decision due to Race/Ethnicity
In-State Applicants						
Alternative Hoxby Opening Report Exhibit 1 Table 1 Row 9 [2]	0.572	26.0%	2.2%	71.9%	14.9%	1.2%
Alternative Hoxby Opening Report Exhibit 1 Table 1 Row 9 with Ratings Variables [3]	0.695	20.4%	2.3%	77.4%	14.2%	1.6%
Out-of-State Applicants						
Alternative Hoxby Opening Report Exhibit 1 Table 1 Row 9 [2]	0.394	47.9%	12.9%	39.3%	18.9%	5.1%
Alternative Hoxby Opening Report Exhibit 1 Table 1 Row 9 with Ratings Variables [3]	0.562	26.2%	11.1%	62.7%	14.7%	6.2%

Source: Connect Carolina; Expert Report and Production of Caroline M. Hoxby, January 12, 2018; Expert Report and Production of Peter S. Arcidiacono, January 17, 2018; Expert Report and Production of Peter S. Arcidiacono, April 6, 2018

Note:

[1] The 2011-12 to 2016-17 admissions cycles refer to the classes of 2016 through 2021 per Arcidiacono's terminology.

[2] As in Exhibit 1 Table 1 Row 9 in the Hoxby Opening Report, regressors include: SAT Combined, ACT Comp, Class Rank, GPA, Sex, Min Coursework, HS Sport, Faculty/Staff Child, Alum Parent, Early Action, Citizenship Type, Fee Waiver, and Within-School GPA Rank (SGR). As suggested in the Arcidiacono Rebuttal Report Section 2.4, this table incorporates the following changes: (a) foreign and incomplete/withdrawn applicants are removed, as are applicants in any "Special Recruiting Category;" (b) indicators for admissions cycle are included; (c) indicators for first generation college are included in lieu of indicators for parents' education; (d) indicators for early action are included; (e) the 2011-12 and 2012-13 admissions cycles are included; (e) the regression is run separately for in-state and out-of-state applicants. Unlike in the Arcidiacono specifications, I do not interact first generation college status with race.

[3] In addition to the changes implemented in Alternative Hoxby Opening Exhibit 1 Table 1 Row 9, per Arcidiacono Rebuttal Report Section 2.4, five ratings variables (program, performance, extracurricular activities, essay, and personal qualities) are included in the Model, and missing indicators are set to 1 for students that have a rating marked as 0.

EXHIBIT 4 TABLE 2

Analyzing UNC's Admissions Process: Race/Ethnicity as Multiplicative Factors 2011-12 to 2016-17 Admissions Cycles [1]

Description of Specification	(A) Pseudo R ²	(B) Share of Pseudo R ² Due to Variables Other than Race/Ethnicity	(C) Share of Pseudo R ² Due to Race/Ethnicity	(D) = (C) x (A) Share of Admissions Decision due to Race/Ethnicity
In-State Applicants				
Alternative Hoxby Opening Report Exhibit 1 Table 2 Row 9 [2]	0.576	87.6%	12.4%	7.1%
Alternative Hoxby Opening Report Exhibit 1 Table 2 Row 9 with Ratings Variables [3]	0.697	87.8%	12.2%	8.5%
Out-of-State Applicants				
Alternative Hoxby Opening Report Exhibit 1 Table 2 Row 9 [2]	0.400	77.7%	22.3%	8.9%
Alternative Hoxby Opening Report Exhibit 1 Table 2 Row 9 with Ratings Variables [3]	0.565	80.1%	19.9%	11.2%

Source: Connect Carolina; Expert Report and Production of Caroline M. Hoxby, January 12, 2018; Expert Report and Production of Peter S. Arcidiacono, January 17, 2018; Expert Report and Production of Peter S. Arcidiacono, April 6, 2018

Note:

[1] The 2011-12 to 2016-17 admissions cycles refer to the classes of 2016 through 2021 per Arcidiacono's terminology.

[2] As in Exhibit 1 Table 2 Row 9 in the Hoxby Opening Report, regressors include: SAT Combined, ACT Comp, Class Rank, GPA, Sex, Min Coursework, HS Sport, Faculty/Staff Child, Alum Parent, Early Action, Citizenship Type, Fee Waiver, and Within-School GPA Rank (SGR). As suggested in the Arcidiacono Rebuttal Report Section 2.4, this table incorporates the following changes: (a) foreign and incomplete/withdrawn applicants are removed, as are applicants in any "Special Recruiting Category;" (b) indicators for admissions cycle are included; (c) indicators for first generation college are included in lieu of indicators for parents' education; (d) indicators for early action are included; (e) the 2011-12 and 2012-13 admissions cycles are included; (e) the regression is run separately for in-state and out-of-state applicants. URM status is a multiplicative factor for all variables (except for the indicator for admissions cycle) in the Model.

[3] In addition to the changes implemented in Alternative Hoxby Opening Exhibit 1 Table 2 Row 9, per Arcidiacono Rebuttal Report Section 2.4, five ratings variables (program, performance, extracurricular activities, essay, and personal qualities) are included in the Model, and missing indicators are set to 1 for students that have a rating marked as 0.

EXHIBIT 5 TABLE 1

Class Rank Admissions Modeling by Accepting Students in Top 7.91% by Class Rank Percentile Predicted Admitted Class, 2014-15 Admissions Cycle [1]

Race/Ethnicity [5]	Actual UNC NC Resident Public School Admitted Students [2]			Predicted UNC NC Resident Public School Admitted Students from the Top 7.91% Pool [3]			Change vis-à-vis Current Actuals [4]		
	Number	Percent of Admitted Students	Avg Test Score [6]	Number	Percent of Admitted Students	Avg Test Score [6]	Number	Percent of Admitted Students	Avg Test Score [6]
African American	349	8.8%	1212	417	10.5%	1085	68	1.7%	-126
Asian	494	12.4%	1375	283	7.1%	1342	-211	-5.3%	-33
Hispanic	238	6.0%	1254	230	5.8%	1158	-8	-0.2%	-96
Native American	70	1.8%	1264	18	0.5%	1132	-52	-1.3%	-132
Pacific Islander	4	0.1%	1270	5	0.1%	1130	1	0.0%	-140
White	2,664	67.1%	1341	2,907	73.2%	1279	243	6.1%	-62
Missing	154	3.9%	1376	-	-	-	-154	-3.9%	-
Multi-racial	-	-	-	113	2.8%	1232	113	2.8%	-
Total	3,973	100.0%	1329	3,973	100.0%	1254	0	0.0%	-75
Total URM [5]	657	16.5%	1233	761	19.2%	1127	104	2.6%	-106
Total non-URM [5]	3,316	83.5%	1348	3,212	80.8%	1284	-104	-2.6%	-64

Source: 2010 Census; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List; U.S. Department of Education

Note:

[1] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[2] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing rank data and test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[3] Summary statistics are calculated across all admitted students using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[4] The difference is calculated as the value under the hypothetical plan minus the value for the actual UNC admitted students.

[5] Under-represented minorities ("URM") include African American, Hispanic, and Native American students. A number of students identified only as multi-racial in NCERDC whereas all students reporting their race in Connect Carolina identified their specific race(s). Based on 2010 Census data, 85% of students self-reporting as multi-racial are considered as URM, and are included in Total URM.

[6] For students who are matched to Connect Carolina and have scores in Connect Carolina, SAT scores are the maximum of their total SAT score in Connect Carolina and the corresponding SAT value for their ACT composite score in Connect Carolina (using the 2009 College Board Concordance Table). For students that do not have Connect Carolina scores and who took the SAT and/or took the ACT multiple times according to NCERDC, SAT scores are the maximum of students' highest combined SAT section scores in NCERDC and the corresponding SAT value for students' highest combined ACT section scores in NCERDC (using the 2009 College Board Concordance Table). For students that do not have Connect Carolina scores and who took only the ACT once but not the SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

EXHIBIT 5 TABLE 2

Class Rank Admissions Modeling by Accepting Students in Top 7.27% by Class Rank Percentile Predicted Matriculated Class, 2014-15 Admissions Cycle [1]

Race/Ethnicity [5]	Actual UNC NC Resident Public School Matriculated Students [2]			Predicted UNC NC Resident Public School Matriculated Students from the Top 7.27% Pool [3]			Change vis-à-vis Current Actuals [4]		
	Number	Percent of Matriculated Students	Avg Test Score [6]	Number	Percent of Matriculated Students	Avg Test Score [6]	Number	Percent of Matriculated Students	Avg Test Score [6]
African American	229	9.2%	1187	282	11.3%	1069	53	2.1%	-119
Asian	350	14.0%	1352	199	8.0%	1319	-151	-6.1%	-34
Hispanic	160	6.4%	1233	156	6.3%	1141	-4	-0.2%	-92
Native American	45	1.8%	1260	11	0.4%	1132	-34	-1.4%	-128
Pacific Islander	2	0.1%	1325	3	0.1%	1119	1	0.0%	-206
White	1,617	64.8%	1328	1,775	71.1%	1267	158	6.3%	-61
Missing	92	3.7%	1358	-	-	-	-92	-3.7%	-
Multi-racial	-	-	-	70	2.8%	1209	70	2.8%	-
Total	2,495	100.0%	1312	2,496	100.0%	1238	1	0.0%	-74
Total URM [5]	434	17.4%	1212	509	20.4%	1109	75	3.0%	-103
Total non-URM [5]	2,061	82.6%	1334	1,988	79.6%	1271	-74	-3.0%	-62

Source: 2010 Census; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List; U.S. Department of Education

Note:

[1] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[2] The baseline actual UNC matriculated students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing rank data and test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[3] The matriculation probability for each NCERDC student is predicted based on a probit regression using data for the actual 2011-12 to 2014-15 UNC admits: matriculation is regressed on maximum SAT combined test score for students with a maximum test score between 1080 and 1460. Regressions are estimated separately by race for African American, Asian, Hispanic, and white students. For Native American and Pacific Islander students, a regression is estimated across all students because of small sample size. Students identified only as multi-racial in NCERDC are given a weighted matriculation probability based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander. Summary statistics are calculated across all admitted students using matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are then calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[4] The difference is calculated as the value under the hypothetical plan minus the value for the actual UNC matriculated students.

[5] Under-represented minorities ("URM") include African American, Hispanic, and Native American students. A number of students identified only as multi-racial in NCERDC whereas all students reporting their race in Connect Carolina identified their specific race(s). Based on 2010 Census data, 85% of students self-reporting as multi-racial are considered as URM, and are included in Total URM.

[6] For students who are matched to Connect Carolina and have scores in Connect Carolina, SAT scores are the maximum of their total SAT score in Connect Carolina and the corresponding SAT value for their ACT composite score in Connect Carolina (using the 2009 College Board Concordance Table). For students that do not have Connect Carolina scores and who took the SAT and/or took the ACT multiple times according to NCERDC, SAT scores are the maximum of students' highest combined SAT section scores in NCERDC and the corresponding SAT value for students' highest combined ACT section scores in NCERDC (using the 2009 College Board Concordance Table). For students that do not have Connect Carolina scores and who took only the ACT once but not the SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

EXHIBIT 6 TABLE 1

Admissions Modeling with 750 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A] Number	[B] Avg Test Score [7]	Feasible Trials out of 100
African American	360	8.8%	1214	43	5.7%	1110	317	1228	0
Asian	519	12.7%	1380	20	2.7%	1130	499	1390	0
Hispanic	241	5.9%	1255	53	7.1%	1137	188	1289	0
Native American	74	1.8%	1272	10	1.3%	1126	64	1295	0
Pacific Islander	4	0.1%	1270	0	0.0%	1098	4	1270	0
White	2,727	66.7%	1342	623	83.2%	1144	2,104	1401	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	749	100.0%	1141	3,337	1373	
Total URM [9]	675	16.5%	1235	106	14.2%	1125	569	1256	0
Total Non-URM [9]	3,411	83.5%	1349	643	85.8%	1143	2,768	1397	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

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EXHIBIT 6 TABLE 2

Admissions Modeling with 1500 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	118	7.9%	1017	242	1310	0
Asian	519	12.7%	1380	36	2.4%	1062	483	1404	0
Hispanic	241	5.9%	1255	116	7.7%	1053	125	1443	0
Native American	74	1.8%	1272	25	1.7%	1040	49	1391	0
Pacific Islander	4	0.1%	1270	1	0.1%	964	3	1372	0
White	2,727	66.7%	1342	1,202	80.2%	1074	1,525	1553	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,498	100.0%	1067	2,588	1483	
Total URM [9]	675	16.5%	1235	259	17.3%	1035	416	1359	0
Total Non-URM [9]	3,411	83.5%	1349	1,239	82.7%	1074	2,172	1507	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

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EXHIBIT 7 TABLE 1

Admissions Modeling with 750 Seats Set Aside for Students from the 10% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A] Number	[B] Avg Test Score [7]	Feasible Trials out of 100
African American	360	8.8%	1214	350	46.6%	841	10	14274	0
Asian	519	12.7%	1380	19	2.5%	907	500	1398	0
Hispanic	241	5.9%	1255	129	17.2%	902	112	1663	0
Native American	74	1.8%	1272	7	0.9%	890	67	1312	0
Pacific Islander	4	0.1%	1270	2	0.3%	863	2	1677	0
White	2,727	66.7%	1342	244	32.5%	967	2,483	1379	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	751	100.0%	894	3,335	1429	
Total URM [9]	675	16.5%	1235	486	64.7%	858	189	2206	0
Total Non-URM [9]	3,411	83.5%	1349	265	35.3%	962	3,146	1382	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

EXHIBIT 7 TABLE 2

Admissions Modeling with 1500 Seats Set Aside for Students from the 25% of High Schools with the Highest Shares of Disadvantaged Students [1] Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	396	26.4%	1052	-36	N/A	0
Asian	519	12.7%	1380	61	4.1%	1124	458	1414	0
Hispanic	241	5.9%	1255	149	9.9%	1079	92	1541	0
Native American	74	1.8%	1272	16	1.1%	1068	58	1328	0
Pacific Islander	4	0.1%	1270	4	0.3%	1151	0	N/A	0
White	2,727	66.7%	1342	872	58.2%	1151	1,855	1432	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,498	100.0%	1116	2,588	1455	
Total URM [9]	675	16.5%	1235	561	37.4%	1060	114	2099	0
Total Non-URM [9]	3,411	83.5%	1349	937	62.6%	1149	2,474	1425	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 25% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Appendix A

Admissions Modeling with 1000 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	58	5.8%	1085	302	1239	0
Asian	519	12.7%	1380	25	2.5%	1109	494	1394	0
Hispanic	241	5.9%	1255	73	7.3%	1098	168	1324	0
Native American	74	1.8%	1272	15	1.5%	1095	59	1317	0
Pacific Islander	4	0.1%	1270	0	0.0%	1071	4	1270	0
White	2,727	66.7%	1342	828	82.9%	1114	1,899	1441	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	999	100.0%	1111	3,087	1401	
Total URM [9]	675	16.5%	1235	146	14.6%	1093	529	1274	0
Total Non-URM [9]	3,411	83.5%	1349	853	85.4%	1114	2,558	1428	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1250 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	87	7.0%	1046	273	1267	0
Asian	519	12.7%	1380	30	2.4%	1091	489	1398	0
Hispanic	241	5.9%	1255	91	7.3%	1076	150	1364	0
Native American	74	1.8%	1272	21	1.7%	1051	53	1360	0
Pacific Islander	4	0.1%	1270	0	0.0%	1054	4	1270	0
White	2,727	66.7%	1342	1,020	81.7%	1093	1,707	1491	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,249	100.0%	1088	2,837	1437	
Total URM [9]	675	16.5%	1235	199	15.9%	1060	476	1308	0
Total Non-URM [9]	3,411	83.5%	1349	1,050	84.1%	1093	2,361	1463	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	33	5.9%	1094	202	1207	0
Asian	365	14.3%	1356	17	3.0%	1125	348	1367	0
Hispanic	162	6.3%	1234	41	7.3%	1125	121	1271	0
Native American	46	1.8%	1262	8	1.4%	1121	38	1291	0
Pacific Islander	2	0.1%	1325	0	0.0%	1087	2	1325	0
White	1,656	64.7%	1329	461	82.3%	1136	1,195	1403	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	560	100.0%	1132	2,001	1365	
Total URM [9]	443	17.3%	1214	82	14.6%	1112	361	1238	0
Total Non-URM [9]	2,118	82.7%	1335	478	85.4%	1136	1,640	1393	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	46	6.0%	1071	189	1221	0
Asian	365	14.3%	1356	22	2.9%	1104	343	1372	0
Hispanic	162	6.3%	1234	58	7.6%	1086	104	1317	0
Native American	46	1.8%	1262	11	1.4%	1089	35	1316	0
Pacific Islander	2	0.1%	1325	0	0.0%	1062	2	1325	0
White	1,656	64.7%	1329	625	82.0%	1107	1,031	1464	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	762	100.0%	1103	1,799	1404	
Total URM [9]	443	17.3%	1214	115	15.1%	1081	328	1261	0
Total Non-URM [9]	2,118	82.7%	1335	647	84.9%	1107	1,471	1435	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1250 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	71	7.3%	1032	164	1260	0
Asian	365	14.3%	1356	26	2.7%	1086	339	1377	0
Hispanic	162	6.3%	1234	73	7.5%	1064	89	1374	0
Native American	46	1.8%	1262	17	1.8%	1044	29	1389	0
Pacific Islander	2	0.1%	1325	0	0.0%	1046	2	1325	0
White	1,656	64.7%	1329	780	80.7%	1085	876	1546	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	967	100.0%	1079	1,594	1457	
Total URM [9]	443	17.3%	1214	161	16.6%	1048	282	1309	0
Total Non-URM [9]	2,118	82.7%	1335	806	83.4%	1085	1,312	1489	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1500 Seats Set Aside for Students that Planned to Attend a 2-Year In-State Community & Technical College Upon Graduation from High School [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	98	8.3%	1004	137	1325	0
Asian	365	14.3%	1356	32	2.7%	1056	333	1385	0
Hispanic	162	6.3%	1234	95	8.1%	1042	67	1508	0
Native American	46	1.8%	1262	20	1.7%	1033	26	1438	0
Pacific Islander	2	0.1%	1325	1	0.1%	960	1	1690	0
White	1,656	64.7%	1329	929	79.1%	1065	727	1666	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,175	100.0%	1057	1,386	1532	
Total URM [9]	443	17.3%	1214	213	18.1%	1023	230	1391	0
Total Non-URM [9]	2,118	82.7%	1335	962	81.9%	1065	1,156	1560	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students that planned to attend a 2-year in-state community or technical college upon graduation from high school in 2014-15 from the NCERDC exit data. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Appendix B

Admissions Modeling with 1000 Seats Set Aside for Students from the 10% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A] Number	[B] Avg Test Score [7]	Feasible Trials out of 100
African American	360	8.8%	1214	470	47.0%	846	-110	N/A	0
Asian	519	12.7%	1380	21	2.1%	908	498	1400	0
Hispanic	241	5.9%	1255	184	18.4%	897	57	2414	0
Native American	74	1.8%	1272	10	1.0%	931	64	1325	0
Pacific Islander	4	0.1%	1270	2	0.2%	870	2	1670	0
White	2,727	66.7%	1342	313	31.3%	966	2,414	1391	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,000	100.0%	895	3,086	1472	
Total URM [9]	675	16.5%	1235	664	66.4%	861	11	23809	0
Total Non-URM [9]	3,411	83.5%	1349	336	33.6%	962	3,075	1392	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

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Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	590	47.2%	845	-230	N/A	0
Asian	519	12.7%	1380	27	2.2%	891	492	1407	0
Hispanic	241	5.9%	1255	245	19.6%	885	-4	N/A	0
Native American	74	1.8%	1272	12	1.0%	917	62	1341	0
Pacific Islander	4	0.1%	1270	3	0.2%	861	1	2497	0
White	2,727	66.7%	1342	372	29.8%	949	2,355	1404	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,249	100.0%	885	2,837	1526	
Total URM [9]	675	16.5%	1235	847	67.8%	857	-172	N/A	0
Total Non-URM [9]	3,411	83.5%	1349	402	32.2%	945	3,009	1403	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

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Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	721	48.2%	832	-361	N/A	0
Asian	519	12.7%	1380	29	1.9%	886	490	1409	0
Hispanic	241	5.9%	1255	302	20.2%	866	-61	N/A	0
Native American	74	1.8%	1272	14	0.9%	905	60	1358	0
Pacific Islander	4	0.1%	1270	3	0.2%	861	1	2498	0
White	2,727	66.7%	1342	428	28.6%	930	2,299	1419	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,497	100.0%	869	2,589	1597	
Total URM [9]	675	16.5%	1235	1,037	69.3%	843	-362	N/A	0
Total Non-URM [9]	3,411	83.5%	1349	460	30.7%	927	2,951	1415	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A] Number	[B] Avg Test Score [7]	Feasible Trials out of 100
African American	360	8.8%	1214	262	35.0%	1001	98	1783	0
Asian	519	12.7%	1380	29	3.9%	1069	490	1398	0
Hispanic	241	5.9%	1255	111	14.8%	1037	130	1442	0
Native American	74	1.8%	1272	10	1.3%	1024	64	1311	0
Pacific Islander	4	0.1%	1270	2	0.3%	1070	2	1470	0
White	2,727	66.7%	1342	334	44.7%	1072	2,393	1380	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	748	100.0%	1041	3,338	1395	
Total URM [9]	675	16.5%	1235	383	51.2%	1012	292	1527	0
Total Non-URM [9]	3,411	83.5%	1349	365	48.8%	1072	3,046	1383	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	380	38.1%	952	-20	N/A	0
Asian	519	12.7%	1380	33	3.3%	1032	486	1404	0
Hispanic	241	5.9%	1255	151	15.1%	993	90	1696	0
Native American	74	1.8%	1272	14	1.4%	993	60	1337	0
Pacific Islander	4	0.1%	1270	3	0.3%	973	1	2162	0
White	2,727	66.7%	1342	416	41.7%	1031	2,311	1398	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	997	100.0%	994	3,089	1439	
Total URM [9]	675	16.5%	1235	545	54.7%	964	130	2370	0
Total Non-URM [9]	3,411	83.5%	1349	452	45.3%	1031	2,959	1398	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

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Admissions Modeling with 1250 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	505	40.5%	901	-145	N/A	0
Asian	519	12.7%	1380	39	3.1%	1005	480	1410	0
Hispanic	241	5.9%	1255	189	15.1%	957	52	2341	0
Native American	74	1.8%	1272	19	1.5%	936	55	1388	0
Pacific Islander	4	0.1%	1270	3	0.2%	969	1	2174	0
White	2,727	66.7%	1342	493	39.5%	998	2,234	1418	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,248	100.0%	952	2,838	1497	
Total URM [9]	675	16.5%	1235	713	57.1%	917	-38	N/A	0
Total Non-URM [9]	3,411	83.5%	1349	535	42.9%	999	2,876	1414	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

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[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

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Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	624	41.7%	874	-264	N/A	0
Asian	519	12.7%	1380	45	3.0%	987	474	1417	0
Hispanic	241	5.9%	1255	235	15.7%	921	6	14354	0
Native American	74	1.8%	1272	23	1.5%	886	51	1446	0
Pacific Islander	4	0.1%	1270	4	0.3%	921	0	N/A	0
White	2,727	66.7%	1342	565	37.8%	971	2,162	1439	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,496	100.0%	922	2,590	1566	
Total URM [9]	675	16.5%	1235	882	59.0%	887	-207	N/A	0
Total Non-URM [9]	3,411	83.5%	1349	614	41.0%	972	2,797	1432	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

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[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

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[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

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Admissions Modeling with 750 Seats Set Aside for Students from the 20% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A] Number	[B] Avg Test Score [7]	Feasible Trials out of 100
African American	360	8.8%	1214	213	28.4%	1106	147	1370	0
Asian	519	12.7%	1380	31	4.1%	1194	488	1392	0
Hispanic	241	5.9%	1255	75	10.0%	1146	166	1305	0
Native American	74	1.8%	1272	6	0.8%	1155	68	1282	0
Pacific Islander	4	0.1%	1270	3	0.4%	1229	1	1394	0
White	2,727	66.7%	1342	422	56.3%	1188	2,305	1370	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	750	100.0%	1161	3,336	1369	
Total URM [9]	675	16.5%	1235	294	39.2%	1117	381	1326	0
Total Non-URM [9]	3,411	83.5%	1349	456	60.8%	1189	2,955	1374	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

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	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	304	30.5%	1056	56	2074	0
Asian	519	12.7%	1380	40	4.0%	1137	479	1400	0
Hispanic	241	5.9%	1255	112	11.2%	1089	129	1400	0
Native American	74	1.8%	1272	10	1.0%	1070	64	1304	0
Pacific Islander	4	0.1%	1270	3	0.3%	1143	1	1651	0
White	2,727	66.7%	1342	529	53.0%	1152	2,198	1388	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	998	100.0%	1114	3,088	1400	
Total URM [9]	675	16.5%	1235	426	42.7%	1065	249	1527	0
Total Non-URM [9]	3,411	83.5%	1349	572	57.3%	1151	2,839	1389	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

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[1] In the disadvantaged step, seats are set aside for students from the 20% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1250 Seats Set Aside for Students from the 20% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	406	32.6%	1020	-46	N/A	0
Asian	519	12.7%	1380	47	3.8%	1125	472	1405	0
Hispanic	241	5.9%	1255	141	11.3%	1058	100	1533	0
Native American	74	1.8%	1272	12	1.0%	1069	62	1311	0
Pacific Islander	4	0.1%	1270	3	0.2%	1138	1	1667	0
White	2,727	66.7%	1342	638	51.2%	1120	2,089	1410	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,247	100.0%	1080	2,839	1440	
Total URM [9]	675	16.5%	1235	559	44.8%	1031	116	2220	0
Total Non-URM [9]	3,411	83.5%	1349	688	55.2%	1120	2,723	1407	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 20% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1500 Seats Set Aside for Students from the 20% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	516	34.5%	986	-156	N/A	0
Asian	519	12.7%	1380	56	3.7%	1096	463	1414	0
Hispanic	241	5.9%	1255	175	11.7%	1026	66	1863	0
Native American	74	1.8%	1272	15	1.0%	1019	59	1336	0
Pacific Islander	4	0.1%	1270	4	0.3%	1132	0	N/A	0
White	2,727	66.7%	1342	731	48.8%	1096	1,996	1432	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,497	100.0%	1049	2,589	1493	
Total URM [9]	675	16.5%	1235	706	47.2%	997	-31	N/A	0
Total Non-URM [9]	3,411	83.5%	1349	791	52.8%	1096	2,620	1426	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 20% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students from the 25% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	157	20.9%	1166	203	1251	0
Asian	519	12.7%	1380	33	4.4%	1233	486	1390	0
Hispanic	241	5.9%	1255	61	8.1%	1201	180	1274	0
Native American	74	1.8%	1272	7	0.9%	1182	67	1281	0
Pacific Islander	4	0.1%	1270	3	0.4%	1260	1	1301	0
White	2,727	66.7%	1342	490	65.2%	1243	2,237	1364	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	751	100.0%	1223	3,335	1355	
Total URM [9]	675	16.5%	1235	225	30.0%	1176	450	1265	0
Total Non-URM [9]	3,411	83.5%	1349	526	70.0%	1242	2,885	1369	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 25% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students from the 25% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	232	23.2%	1124	128	1378	0
Asian	519	12.7%	1380	46	4.6%	1180	473	1399	0
Hispanic	241	5.9%	1255	83	8.3%	1162	158	1304	0
Native American	74	1.8%	1272	9	0.9%	1152	65	1289	0
Pacific Islander	4	0.1%	1270	3	0.3%	1254	1	1317	0
White	2,727	66.7%	1342	626	62.7%	1204	2,101	1383	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	999	100.0%	1181	3,087	1379	
Total URM [9]	675	16.5%	1235	324	32.4%	1134	351	1328	0
Total Non-URM [9]	3,411	83.5%	1349	675	67.6%	1203	2,736	1385	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 25% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1250 Seats Set Aside for Students from the 25% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Admitted Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Admitted Students [3]			Predicted UNC NC Resident Public School Admitted Students from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Admitted Students	Avg Test Score [4]	Number [6]	Percent of Admitted Students	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	360	8.8%	1214	311	24.9%	1085	49	2030	0
Asian	519	12.7%	1380	51	4.1%	1168	468	1403	0
Hispanic	241	5.9%	1255	109	8.7%	1124	132	1364	0
Native American	74	1.8%	1272	12	1.0%	1108	62	1304	0
Pacific Islander	4	0.1%	1270	4	0.3%	1154	0	N/A	0
White	2,727	66.7%	1342	762	61.0%	1174	1,965	1407	0
Missing	161	3.9%	1378	-	-	-	161	1378	-
Total	4,086	100.0%	1330	1,249	100.0%	1146	2,837	1411	
Total URM [9]	675	16.5%	1235	432	34.6%	1096	243	1483	0
Total Non-URM [9]	3,411	83.5%	1349	817	65.4%	1173	2,594	1405	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 25% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[5] Summary statistics are calculated across all students identified for admission using application probabilities as weights. Application probabilities are 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students from the 10% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	320	48.8%	828	-85	N/A	0
Asian	365	14.3%	1356	17	2.6%	896	348	1379	0
Hispanic	162	6.3%	1234	113	17.2%	887	49	2035	0
Native American	46	1.8%	1262	6	0.9%	859	40	1322	0
Pacific Islander	2	0.1%	1325	2	0.3%	857	0	N/A	0
White	1,656	64.7%	1329	198	30.2%	948	1,458	1381	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	656	100.0%	876	1,905	1465	
Total URM [9]	443	17.3%	1214	439	66.9%	843	4	41932	0
Total Non-URM [9]	2,118	82.7%	1335	217	33.1%	943	1,901	1380	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students from the 10% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	430	49.0%	834	-195	N/A	0
Asian	365	14.3%	1356	20	2.3%	897	345	1383	0
Hispanic	162	6.3%	1234	162	18.5%	885	0	N/A	0
Native American	46	1.8%	1262	8	0.9%	903	38	1337	0
Pacific Islander	2	0.1%	1325	2	0.2%	864	0	N/A	0
White	1,656	64.7%	1329	255	29.1%	949	1,401	1398	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	877	100.0%	879	1,684	1541	
Total URM [9]	443	17.3%	1214	600	68.4%	849	-157	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	277	31.6%	945	1,841	1394	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1250 Seats Set Aside for Students from the 10% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	541	49.2%	834	-306	N/A	0
Asian	365	14.3%	1356	25	2.3%	881	340	1391	0
Hispanic	162	6.3%	1234	217	19.7%	874	-55	N/A	0
Native American	46	1.8%	1262	10	0.9%	894	36	1364	0
Pacific Islander	2	0.1%	1325	2	0.2%	856	0	N/A	0
White	1,656	64.7%	1329	305	27.7%	934	1,351	1418	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,100	100.0%	872	1,461	1647	
Total URM [9]	443	17.3%	1214	768	69.8%	846	-325	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	332	30.2%	930	1,786	1410	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1500 Seats Set Aside for Students from the 10% of High Schools with the Highest Shares of Disadvantaged Students [1] Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	666	50.0%	823	-431	N/A	0
Asian	365	14.3%	1356	27	2.0%	877	338	1394	0
Hispanic	162	6.3%	1234	270	20.3%	856	-108	N/A	0
Native American	46	1.8%	1262	12	0.9%	884	34	1395	0
Pacific Islander	2	0.1%	1325	3	0.2%	856	-1	N/A	0
White	1,656	64.7%	1329	354	26.6%	915	1,302	1441	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,332	100.0%	856	1,229	1811	
Total URM [9]	443	17.3%	1214	948	71.2%	833	-505	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	384	28.8%	912	1,734	1429	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 10% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	219	36.4%	982	16	4062	0
Asian	365	14.3%	1356	26	4.3%	1058	339	1379	0
Hispanic	162	6.3%	1234	91	15.1%	1023	71	1505	0
Native American	46	1.8%	1262	8	1.3%	1007	38	1315	0
Pacific Islander	2	0.1%	1325	1	0.2%	1048	1	1602	0
White	1,656	64.7%	1329	257	42.7%	1057	1,399	1379	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	602	100.0%	1024	1,959	1403	
Total URM [9]	443	17.3%	1214	318	52.8%	994	125	1775	0
Total Non-URM [9]	2,118	82.7%	1335	284	47.2%	1057	1,834	1378	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	328	39.7%	933	-93	N/A	0
Asian	365	14.3%	1356	30	3.6%	1018	335	1386	0
Hispanic	162	6.3%	1234	127	15.4%	978	35	2165	0
Native American	46	1.8%	1262	12	1.5%	972	34	1364	0
Pacific Islander	2	0.1%	1325	3	0.4%	954	-1	N/A	0
White	1,656	64.7%	1329	327	39.5%	1014	1,329	1406	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	827	100.0%	976	1,734	1475	
Total URM [9]	443	17.3%	1214	467	56.5%	946	-24	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	360	43.5%	1014	1,758	1401	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1250 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	447	42.3%	882	-212	N/A	0
Asian	365	14.3%	1356	35	3.3%	991	330	1395	0
Hispanic	162	6.3%	1234	162	15.3%	941	0	N/A	0
Native American	46	1.8%	1262	16	1.5%	914	30	1447	0
Pacific Islander	2	0.1%	1325	3	0.3%	950	-1	N/A	0
White	1,656	64.7%	1329	394	37.3%	980	1,262	1438	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,057	100.0%	932	1,504	1583	
Total URM [9]	443	17.3%	1214	625	59.1%	898	-182	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	432	40.9%	981	1,686	1426	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1500 Seats Set Aside for Students from the 15% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	559	43.5%	855	-324	N/A	0
Asian	365	14.3%	1356	41	3.2%	974	324	1404	0
Hispanic	162	6.3%	1234	204	15.9%	904	-42	N/A	0
Native American	46	1.8%	1262	20	1.6%	864	26	1568	0
Pacific Islander	2	0.1%	1325	4	0.3%	902	-2	N/A	0
White	1,656	64.7%	1329	458	35.6%	952	1,198	1473	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,286	100.0%	901	1,275	1730	
Total URM [9]	443	17.3%	1214	783	60.9%	868	-340	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	503	39.1%	953	1,615	1454	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 15% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students from the 20% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	163	29.4%	1090	72	1421	0
Asian	365	14.3%	1356	25	4.5%	1181	340	1369	0
Hispanic	162	6.3%	1234	57	10.3%	1134	105	1289	0
Native American	46	1.8%	1262	5	0.9%	1148	41	1276	0
Pacific Islander	2	0.1%	1325	2	0.4%	1220	0	N/A	0
White	1,656	64.7%	1329	303	54.6%	1176	1,353	1363	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	555	100.0%	1147	2,006	1360	
Total URM [9]	443	17.3%	1214	225	40.5%	1102	218	1330	0
Total Non-URM [9]	2,118	82.7%	1335	330	59.5%	1177	1,788	1364	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 20% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students from the 20% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	244	31.9%	1037	-9	N/A	0
Asian	365	14.3%	1356	34	4.4%	1120	331	1380	0
Hispanic	162	6.3%	1234	89	11.6%	1075	73	1428	0
Native American	46	1.8%	1262	8	1.0%	1058	38	1305	0
Pacific Islander	2	0.1%	1325	3	0.4%	1123	-1	N/A	0
White	1,656	64.7%	1329	388	50.7%	1138	1,268	1387	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	766	100.0%	1097	1,795	1407	
Total URM [9]	443	17.3%	1214	341	44.5%	1048	102	1772	0
Total Non-URM [9]	2,118	82.7%	1335	425	55.5%	1137	1,693	1385	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 20% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

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[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

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Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	335	34.2%	1002	-100	N/A	0
Asian	365	14.3%	1356	40	4.1%	1110	325	1386	0
Hispanic	162	6.3%	1234	114	11.6%	1044	48	1686	0
Native American	46	1.8%	1262	10	1.0%	1054	36	1319	0
Pacific Islander	2	0.1%	1325	3	0.3%	1117	-1	N/A	0
White	1,656	64.7%	1329	478	48.8%	1105	1,178	1420	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	980	100.0%	1062	1,581	1470	
Total URM [9]	443	17.3%	1214	459	46.8%	1014	-16	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	521	53.2%	1105	1,597	1410	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

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[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1500 Seats Set Aside for Students from the 20% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non-Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	437	36.4%	968	-202	N/A	0
Asian	365	14.3%	1356	49	4.1%	1081	316	1399	0
Hispanic	162	6.3%	1234	145	12.1%	1012	17	3131	0
Native American	46	1.8%	1262	12	1.0%	1002	34	1353	0
Pacific Islander	2	0.1%	1325	3	0.2%	1111	-1	N/A	0
White	1,656	64.7%	1329	556	46.3%	1080	1,100	1455	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,202	100.0%	1030	1,359	1565	
Total URM [9]	443	17.3%	1214	594	49.4%	979	-151	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	608	50.6%	1080	1,510	1438	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 20% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 750 Seats Set Aside for Students from the 25% of High Schools with the Highest Shares of Disadvantaged Students [1]

Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	112	21.3%	1153	123	1227	0
Asian	365	14.3%	1356	26	4.9%	1224	339	1366	0
Hispanic	162	6.3%	1234	45	8.5%	1189	117	1252	0
Native American	46	1.8%	1262	5	0.9%	1178	41	1272	0
Pacific Islander	2	0.1%	1325	2	0.4%	1256	0	N/A	0
White	1,656	64.7%	1329	337	63.9%	1233	1,319	1353	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	527	100.0%	1211	2,034	1341	
Total URM [9]	443	17.3%	1214	162	30.7%	1164	281	1244	0
Total Non-URM [9]	2,118	82.7%	1335	365	69.3%	1233	1,753	1356	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 25% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

[2] The 2014-15 admissions cycle refers to the class of 2019 per Arcidiacono's terminology.

[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Admissions Modeling with 1000 Seats Set Aside for Students from the 25% of High Schools with the Highest Shares of Disadvantaged Students [1] Predicted Matriculated Class, 2014-15 Admissions Cycle [2]

Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	175	24.0%	1108	60	1434	0
Asian	365	14.3%	1356	38	5.2%	1169	327	1378	0
Hispanic	162	6.3%	1234	63	8.6%	1150	99	1288	0
Native American	46	1.8%	1262	7	1.0%	1147	39	1282	0
Pacific Islander	2	0.1%	1325	2	0.3%	1250	0	N/A	0
White	1,656	64.7%	1329	444	60.9%	1192	1,212	1379	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	729	100.0%	1167	1,832	1373	
Total URM [9]	443	17.3%	1214	245	33.6%	1120	198	1331	0
Total Non-URM [9]	2,118	82.7%	1335	484	66.4%	1191	1,634	1378	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

Note:

[1] In the disadvantaged step, seats are set aside for students from the 25% of high schools with the highest shares of disadvantaged students. The students admitted in the disadvantaged stage are those with the highest values of the race-blind admission index described in my opening report (Hoxby Opening Report, ¶ 253).

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[3] The baseline actual UNC admitted students' statistics were calculated from Connect Carolina using North Carolina resident public school students with non-missing test scores. The federal waterfall for race/ethnicity, which is used by NCERDC, identifies individuals as Hispanic or not Hispanic, then secondarily categorizes them as African American, Native American, Asian, Pacific Islander, or white (2007 USED Guidance on Maintaining, Collecting, and Reporting Race and Ethnicity Data). In contrast, Connect Carolina categorizes individuals that are both African American and Hispanic as African American. To allow for consistent comparisons, in this analysis, Connect Carolina race/ethnicity is converted according to the order of the federal race/ethnicity waterfall, such that a Hispanic and African American individual is categorized as Hispanic.

[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

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Race/Ethnicity	Actual UNC NC Resident Public School Matriculants [3]			Predicted UNC NC Resident Public School Matriculants from Disadvantaged Pool [5]			Students Needed from Non- Disadvantaged Pool to Match Actual		Feasibility [8]
	Number	Percent of Matriculants	Avg Test Score [4]	Number [6]	Percent of Matriculants	Avg Test Score [4]	[A]	[B]	Feasible Trials out of 100
							Number	Avg Test Score [7]	
African American	235	9.2%	1191	243	26.0%	1068	-8	N/A	0
Asian	365	14.3%	1356	43	4.6%	1157	322	1383	0
Hispanic	162	6.3%	1234	84	9.0%	1111	78	1368	0
Native American	46	1.8%	1262	9	1.0%	1099	37	1301	0
Pacific Islander	2	0.1%	1325	3	0.3%	1138	-1	N/A	0
White	1,656	64.7%	1329	551	59.1%	1160	1,105	1413	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	933	100.0%	1131	1,628	1419	
Total URM [9]	443	17.3%	1214	336	36.0%	1079	107	1638	0
Total Non-URM [9]	2,118	82.7%	1335	597	64.0%	1160	1,521	1404	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

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Asian	365	14.3%	1356	52	4.5%	1111	313	1397	0
Hispanic	162	6.3%	1234	119	10.4%	1064	43	1705	0
Native American	46	1.8%	1262	12	1.0%	1058	34	1334	0
Pacific Islander	2	0.1%	1325	3	0.3%	1135	-1	N/A	0
White	1,656	64.7%	1329	640	55.9%	1136	1,016	1450	0
Missing	95	3.7%	1359	-	-	-	95	1359	-
Total	2,561	100.0%	1314	1,145	100.0%	1098	1,416	1489	
Total URM [9]	443	17.3%	1214	450	39.3%	1042	-7	N/A	0
Total Non-URM [9]	2,118	82.7%	1335	695	60.7%	1134	1,423	1433	

Source: 2010 Census; 2010-2014 American Community Survey 5-Year Estimates; College Board; Connect Carolina; Connect Carolina-NCERDC Crosswalk; "Multiple Testers: What Do We Know About Them?," Harmston, M. and J. Crouse, ACT Inc., 2016; NCERDC; North Carolina Public High School List

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[4] For students who took the SAT and/or took the ACT multiple times, SAT scores are the maximum of students' highest combined SAT section scores and the corresponding SAT value for students' highest combined ACT section scores (using the 2009 College Board Concordance Table). For students who took only the ACT once but not SAT, SAT scores are the corresponding SAT value for students' highest combined ACT section scores plus 40 points. The 40 points adjustment roughly corresponds to a student's ACT score being adjusted up by 1.1 points, as the ACT reports that students first testing as juniors increase their Composite score by 1.1 points by their final test session (Harmston and Crouse, 2016).

[5] The matriculation probability for each NCERDC student is predicted based on a probit regression model using data for the actual 2013-14 and 2014-15 UNC admits: matriculation is regressed on maximum test score for students with a maximum test score between 1080 and 1460. Regression is estimated separately by race for African American, Asian, Hispanic, White students. For Native American and Pacific Islander students, regression is estimated across all students because of small sample size. Summary statistics are calculated across all students identified for admission using application and matriculation probabilities as weights. Fitted matriculation probabilities conditional on admission are calculated and reduced by multiplying them by 0.75 to account for the likelihood that not all identified students will apply to UNC.

[6] Students identified only as multi-racial in NCERDC are allocated to other race/ethnicity categories based on 2010 Census data for those who self-reported as multi-racial: 52.5% African American, 12.7% Asian, 20.7% Hispanic, 11.7% Native American, and 1.3% Pacific Islander.

[7] "N/A" indicates that the number of students needed from the non-disadvantaged pool to match UNC's actual number of that race/ethnicity is negative.

[8] Feasibility is determined as follows. The Connect Carolina-NCERDC Crosswalk is utilized to construct a pool of matched actual UNC NC resident public school admits for 2014-15. Students admitted in the disadvantaged step are removed. Students to fill the UNC class are then randomly drawn from this pool 100 times. A trial is considered "feasible" if 1) the number of students of a given race/ethnicity needed (shown in column [A]) is less than or equal to the number of students picked of that race/ethnicity in the trial, and 2) the average test score for students of a given race/ethnicity needed (shown in column [B]) is less than or equal to the average test score for students picked of that race/ethnicity in the trial. If the number of students needed (column [A]) is negative, then all trials are either feasible or not depending on whether the average test scores for the students in the disadvantaged pool are greater or less than the average test scores for the actual students.

[9] Under-represented minorities ("URM") include African American, Hispanic, and Native American students.

Appendix C

Materials Relied Upon

Academic Articles

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- Expert Report of Peter S. Arcidiacono, filed on January 17, 2018.
- Expert Rebuttal Report of Peter S. Arcidiacono, filed on April 6, 2018.
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- “Transfer Facts 2017,” *North Carolina State University*, <https://data.emas.ncsu.edu/project/transfer-profile/>, accessed June 6, 2018.
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All other materials cited in this report, in my April 6, 2018 report, and in my January 12, 2018 report.